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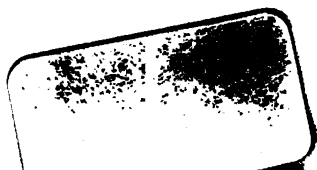
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ON THE IDENTIFICATION  
OF THE  
ANIMALS AND PLANTS OF INDIA  
WHICH WERE KNOWN TO EARLY GREEK AUTHORS.

BY  
V. BALL, M.A., F.R.S.,  
*Director, Science and Art Museum, Dublin.*

A PAPER

Read before the **ROYAL IRISH ACADEMY**, June 9, 1884;

and

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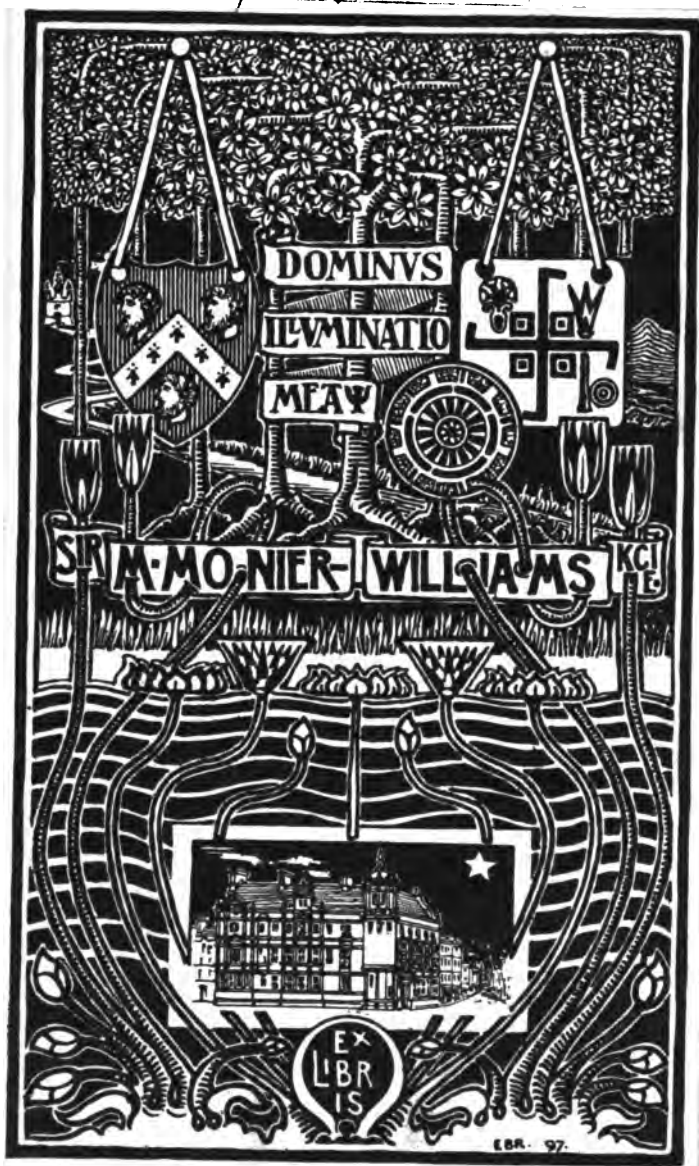
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XLIX.—ON THE IDENTIFICATION OF THE ANIMALS AND PLANTS OF INDIA WHICH WERE KNOWN TO EARLY GREEK AUTHORS. By V. BALL, M.A., F.R.S., Director, Science and Art Museum, Dublin.

[Read, June 9, 1884.]

IN a communication made by me last year to the Royal Geological Society of Ireland, entitled "A Geologist's Contribution to the History of India," I endeavoured to identify many mineral productions which are mentioned by the writers of antiquity. Partly by the recorded characteristics of these minerals, partly by such indications as are given of the localities whence they were derived, I was enabled, by a comparison with our present knowledge of the mode of occurrence and distribution of minerals in India, to arrive at a number of conclusions, the main tendency of which has been to show that many apparently extravagant and fictitious stories by these early writers rest on substantial bases of facts.

While engaged upon that inquiry with reference to minerals, I came upon numerous allusions to animals and plants, for some of which, in spite of their apparently mythical character, I felt sure that equally substantial foundations could be found by subjecting them to the same sort of analytical comparisons with known facts. From time to time, as leisure has been found for the purpose, I have carried on this investigation, and have occasionally published some of the results.<sup>1</sup>

Inquiries like these belong, if I may use the expression, to a border land where the student of books and the student of nature may meet and afford one another mutual assistance.

I possess no special philological qualifications for this kind of work, and have only a slight acquaintance with a few of the languages of India; but, on the other hand, I think I may lay claim to the possession of some special knowledge of the animals and plants of India, the ideas about them which are current among the natives, and the uses they put them to. During my travels in the wildest regions of India I have ever taken an interest in the customs and beliefs of the so-called aboriginal tribes, and have had many opportunities for tracing out stories believed by them, and also sometimes by Europeans, to the sources from whence they had originated. This kind of experience enables me now to take up the tale of explanation where it has often been left by linguists and historians, and carry it forward to a satisfactory conclusion.

A want of personal acquaintance with India, or when that was possessed, a want of such information as can only be acquired by a

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<sup>1</sup> *The Academy*, April 21, 1883, and April 19, 1884.

field naturalist, using the title in its widest sense, has caused many commentators, both among the early Greeks and Romans and the Continental and English *literati* of the present day, when at a loss to explain the so-called myths, to turn upon their authors and accuse them roundly of mendacity. Thus Strabo states succinctly that, "Generally speaking, the men who have hitherto written on the affairs of India were a set of liars." Again, Lassen has spoken of Ktesias, when referring to a particular statement of his, in much the same way, although I shall be able to demonstrate that the condemnation was in that particular case wholly undeserved.

The Euemeristic treatment of myths, according to which all that is possible may be accepted as historical, while the remainder is to be rejected as fiction, is all very well, provided that the person who conducts the analysis has become competent to do so by the nature and extent of his experience.

Elsewhere<sup>2</sup> I have recorded numerous reported cases of children having been found living in wolves' dens in India; and these, to say the least, cannot be fairly disposed of in the off-hand manner that the follower of the Euemeristic doctrine would apply to the story of Romulus and Remus, and many others like it.

The well-known Arabian story, related by the author of Sinbad the Sailor, Marco Polo, and Nicolo Conti, of the method of obtaining diamonds by hurling pieces of meat into a valley, had its origin, as I believe, in an Indian custom of sacrificing cattle on the occasion of opening up new mines, and leaving portions of the meat as an offering to the guardian deities, these naturally being speedily carried off by birds of prey. This custom is not yet extinct.

The so-called myth of the gold-digging ants was not cleared up till, by chance, information was received<sup>3</sup> as to the customs and habits of the Thibetan gold miners of the present day. Then Sir H. Rawlinson, and, independently, Dr. Schiørn, of Copenhagen, were enabled to come forward and state beyond a question of doubt that the *myrmecæ* of Herodotus and Megasthenes were Thibetan miners, and, it may be added, their dogs. The same dogs are now for the first time identified, as will be seen further on, with the *griffins*. The full account of this discovery by the above-named authors would find its proper place in a Paper on races of men, so that I pass from it now, save that I mention a contribution which I have made to it, namely, that the horn of the gold-digging ant, which we are told by Pliny was preserved in the temple of Hercules at Erythræ, and which for centuries has been the subject of much speculation, was probably merely one of the gold-miners' pickaxes. I have been informed by an eyewitness, Mr. R. Lydekker, that the picks in use by agriculturists and miners in Ladak consist of horns of wild sheep mounted on handles.

<sup>2</sup> *Jungle Life in India*, and *Journal of the Anthropological Institute*, 1880.

<sup>3</sup> From the Reports of the Pundits employed in Trans-Himalayan Exploration by the Indian Government.

I believe it probable that Dr. Schiern would be willing to accept this in preference to his own suggestion, namely, that the horns were taken from the skins which are worn as garments by the Thibetans. Perhaps it is as well to add here further, for the benefit of those who may not be aware of the origin of the connexion between ants and gold, that independently that part of the myth was cleared up some years ago, first by Dr. Wilson,<sup>4</sup> who pointed out that the Sanskrit name for the small fragments of alluvial gold (gold dust) was *paippilaka*, meaning "ant-gold," in reference to the size and form; but the characteristics of the "ants" were always supposed, up to the year 1867, to have been wholly imaginative. Then, however, it was found, as related above, that these characteristics were in the most minute particulars identical with those of Thibetan miners. The whole is an example of what has occurred in reference to other subjects also, namely, the too literal acceptance by the Greeks of the signification of Oriental words, the merely symbolical meaning not having been understood as such. This is, for instance, notably the case with reference to the "Indian Reed": cf. p. 336.

It may be here noted that in the foot-notes to various editions of Ktesias, Megasthenes, Herodotus, Ælian, and Strabo, *i. e.* the authors who furnish the principal part of the statements with which this Paper deals, commentators have not unfrequently suggested alterations in the accepted text to suit their preconceived notions of what is possible. With regard to several cases of this kind, I believe the explanations offered in the following pages will show that the text would lose the meanings intended were such changes adopted. Again, there are cases where commentators have suggested derivations for Greek words from Sanskrit or Persian names, which will, I think, be shown to be incorrect.

Many of the identifications of animals and plants suggested by commentators exhibit a sublime indifference on their part to the laws which govern and the facts observed with reference to the geographical distribution of animals. Such looseness is akin to the custom common enough among Englishmen in India of talking about animals by names strictly applicable to species not found in the Oriental Region. Thus you will hear, at the present day, sportsmen speaking of panthers, bison, elk, armadillos, alligators, toucans, canvas-back-ducks, and humming-birds as being commonly shot by them in India, though as a matter of fact none of the animals to which these names are correctly applicable are ever found beyond the limits of the American Continent.

As an example of how statements about animals sometimes require strict investigation, I remember on one occasion an Englishman assuring me *very positively* that sulphur-crested cockatoos were to be found in large numbers in a particular jungle in the Central Provinces of India. On my pointing out the impossibility of such being the case,

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<sup>4</sup> Asiatic Researches.



the only evidence he could bring in support of the statement that this essentially Australian bird was to be found so far from its proper limits, was that the Rajah of the district told him so when he had been shown a domesticated specimen. To which I could only reply that a boastful spirit as to the resources of his own territory must have led the Rajah to be guilty of what was a downright falsehood.

I have still another charge to make against the commentators. Up to the very last edition of one of our Greek authors, which was published in the present year, a custom has been in practice of passing very stale comments from one to another, without reference being made to more recent and direct sources of information.

And here I would mention the names of two encyclopædists for whose works I have the greatest respect and admiration: they are Lassen and Ritter, to the researches by both of whom commentators are much beholden. But as may readily be conceived, during the last fifty years there has been a great advance in our scientific and accurate knowledge of the animals and plants of India, nevertheless we find modern editors making use of statements proximately derived from Lassen, but which are often ultimately traceable to that most industrious compiler, Karl Ritter, who wrote nearly fifty years ago. Were he alive he would probably have kept better abreast with modern research than have so many who now use the *data* which he collected from still earlier writers. Surely such a statement as that there is at present a tribe of Khonds in the Dekkan, who eat the bodies of their deceased relatives, is one that ought not to appear, as it does in a recent edition, except it can be substantiated.<sup>5</sup> It may be true; but, I must confess, that without modern and undoubted proof of the fact, I am unwilling to believe it.

The original texts of Megasthenes and Ktesias not having been preserved to us, except as fragments which have been incorporated by other authors, we cannot say with certainty what they may or may not have contained; but it is sufficiently apparent that it is precisely the most marvellous and apparently impossible descriptions which have been preserved, sometimes out of mere curiosity, and sometimes for purposes of condemnation; the plain matter-of-fact stories about men, animals, and plants, if they ever existed, have been irretrievably lost.

Though not unaware that I run the risk of some adverse criticism when entering into an arena of controversy like this, I have already received a considerable amount of encouragement from quarters where such work is duly appreciated; but the highest incentive I have had in the elucidation of these myths, apart at least from the interest of the study itself, is, that as a former Indian traveller myself, I derive a sincere pleasure in so far establishing the veracity and relieving the characters of travellers from the aspersions which during twenty centuries, more or less, have been freely cast upon them.

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<sup>5</sup> Cf. Herodotus, by Prof. Sayce.

I take for my text and for my justification, if need there be, the following passage from De Gubernatis, who, although the author of a zoological mythology, lays no claim to being a zoologist himself. He says: "And if I have sought to compare several physiological laws with the myths, it is not because I attribute to the myth a wisdom greater than that which it contains in reality, but only to indicate that, much better than metaphysics, the science of Nature, with the criteria of positive philosophy can help us to study the original production of myths and their successive development in tradition."

It will be observed in the pages which follow that, besides the simple identifications, there are what may conveniently be called compound identifications of two classes. In the first, two or more animals, as described by the compilers, are shown to owe their origin to accounts by different authors of the same animals or plants, the identity of which was not perceived by compilers like *Ælian* (*cf.* p. 316). In the other class, under one name, characteristics belonging to more than one species are included (*cf.* p. 331). Both these, but especially the latter, have increased the difficulties of identification.<sup>6</sup>

But a few words remain to be said as to the arrangement of the facts contained in the following pages. Originally it was my intention to make use of some of them as illustrations of a Paper on the origin of myths; but, as they multiplied, it seemed to me that they would have an additional value if they were so arranged that they could be easy of reference; and, in order to complete the list, I have included many identifications which have been made by others. This is more particularly the case with the plants yielding drugs: these have for a long time attracted the notice of botanists and other experts; but their determinations have not in all instances been incorporated into the footnotes of commentators.

There still remain a few accounts of animals and plants which have yet to be grappled with; some of these I hope to be able to discuss hereafter, and it may be that I shall see my way to account for some of the so-called mythical tribes of men described by the early Greeks. Some of them, however, appear to be quite beyond the reach of explanation, but others may possibly be identified with particular tribes of what are commonly, but not always correctly, called the aboriginal inhabitants of India.

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<sup>6</sup> Pliny's accounts of minerals furnish a striking example of both: on the one hand, under half a dozen different names, culled from different authors, he has described the same mineral over and over again without recognizing the identity. In several cases, notably in that of the *Adamas*, he describes several distinct minerals under one title.

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*Shellen*

<sup>1</sup> This animal is included here because it has been mistaken by some commentators for the Indian jackal. It belongs, as correctly stated by Ktesias, to the African fauna.

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## MAMMALS:

## 1. MONKEY (Πίθηκος).

*Inuus rhesus*, Des. (?)—The Bengal Monkey, or *Macacus radiatus*, Kuhl.  
The Madras Monkey.

According to Strabo,<sup>10</sup> Megasthenes says, “There are monkeys, rollers of rocks, which climb precipices, whence they roll down stones upon their pursuers.” I am not prepared to deny that this story may have originated in the title of monkey which, as is well known, was freely bestowed upon the wild tribes of men who inhabited the jungles of India, and who, when attacked, often had recourse to this mode of defence against their better armed assailants. But that it is not impossible that the story may have referred to real monkeys will be apparent from the following personal experience of my own:—“When at Malwa Tal, a lake near Naini Tal, in the Himalayas, I was warned that in passing under a landslip, which slopes down to the lake, I should be liable to have stones thrown at me by monkeys. Regarding this as being possibly a traveller’s tale, I made a particular point of going to the spot in order to see what could have given rise to it. As I approached the base of the landslip, near the road on the north side of the lake, I saw a number of brown monkeys (*Inuus rhesus*) rush to the sides and

<sup>8</sup> Vide No. 18.<sup>9</sup> Vide No. 8.<sup>10</sup> Geographica, xv. 1, 56. Cf. Megasthenes, by J. W. M’Crindle, p. 58.

across the top of the landslip, and presently pieces of loosened stone and shale came tumbling down near where I stood. I fully satisfied myself that this was not merely accidental, for I distinctly saw one monkey industriously, with both fore paws, and with obvious *malice prepense*, pushing the loose shingle off a shoulder of rock. I then tried the effect of throwing stones at them, and this made them quite angry, and the number of fragments which they set rolling was speedily doubled. This, though it does not actually amount to throwing or projecting an object by monkeys, comes very near to the same thing, and makes me think that there may be truth in the stories of their throwing fruit at people from trees,"<sup>11</sup> or at least dropping them on their heads.

## 2. LONG-TAILED MONKEY (κερκοπίθηκος).

*Presbytis priamus*, Elliot.—The Madras Langur.

There can be little doubt that another species of monkey, described by Megasthenes, as recorded by Strabo and Ælian, belonged to the genus *Presbytis*, and it may, I think, be identified with the Madras species *priamus* rather than with the Bengal species *entellus*. "The monkeys of India," writes Strabo,<sup>12</sup> "are larger than the largest dogs. They are white except in the face, which is black, though the contrary is observed elsewhere. Their tails are more than two cubits in length; they are very tame, and not of a malicious disposition, so that they neither attack nor steal." An account by Ælian<sup>13</sup> is more detailed. "Among the Prasii (Sansk., *Prachyas*, i. e. Easterns) in India there are found, they say, apes of human-like intelligence, which are to appearance about the size of Hyrkanian dogs. Nature has furnished them with forelocks, which one ignorant of the reality would take to be artificial. Their chin, like that of a satyr, turns upward, and their tails are like the potent one of the lion. Their bodies are white all over, except the face and the tip of the tail, which are of a reddish hue. They are very intelligent and naturally tame. They are bred in the woods, where also they live, subsisting on the fruits which they find growing wild on the hills. They resort in great numbers to Latage, an Indian city, where they eat rice, which has been laid down for them by the King's orders. In fact, every day a ready-prepared meal is set out for their use. It is said that when they have satisfied their appetite they retire in an orderly manner to their haunts in the woods without injuring a single thing that comes in their way." Ælian gives another account also, which differs in some respects from the above; but on the whole, considering the region to which the account of

<sup>11</sup> *Jungle Life in India*, p. 537.

<sup>12</sup> *Geographica*, xv. 1, 37.

<sup>13</sup> *Hist. Anim.*, xvi. 10. Cf. Megasthenes, by J. W. M'Crindle, p. 67.

Megasthenes referred, I think that the species was the above, the technical description of which, given by Jerdon,<sup>14</sup> is as follows:—“Ashy grey colour, with a pale reddish or *chocolat au lait* overlying the whole back and head; sides of the head, chin, throat, and beneath, pale yellowish; hands and feet, whitish; face, palms, and fingers, and soles of the feet and toes, black; a high compressed vertical crest of hairs on the top of the head; hairs long and straight, not wavy; tail, of the colour of the darker portion of the back, ending in a whitish tuft; much the same size as *entellus*, i. e.—length to root of tail, 30 inches; tail, 43 inches; but it attains a still larger size. Inhabits eastern ghâts and southern portion of table-land of Southern India, also in Ceylon, but not extending to Malabar coast.”

Setting out rice for the use of monkeys, as described by Ælian, is a common custom at present.

### 3. THE FLYING SERPENT (Ὀφίς πτερωτός).

*Pteropus edwardsi*, Geoff.—The Flying Fox.

Strabo,<sup>15</sup> quoting from Megasthenes, tells us that there are “in some parts of the country serpents two cubits long, which have membranous wings like bats. They fly about by night, when they let fall drops of urine or sweat, which blister the skin of persons not on their guard, with putrid sores.” Ælian<sup>16</sup> gives a similar account. There can be little doubt that this is an exaggerated account of the great fruit-eating bats of India, which are known to Europeans as flying foxes. The extent of their wings, according to Jerdon, sometimes amounts to 52 inches, and in length they reach 14½ inches. Though noisome animals in many respects, their droppings have not the properties above attributed. Flying foxes are eaten by some of the lower classes of natives, and Europeans who have made the experiment say the flesh is delicate and without unpleasant flavour. As to the winged scorpions which, according to Megasthenes, sting both natives and Europeans alike, I can only suggest that they were hornets of large size.

### 4. THE MARTIKHORA (Μαρτιχώρας, Ἀνδροφάγος).

*Felis tigris*, Linn.—The Tiger.

This animal was described by Ktesias as being of the size of the lion, red in colour, with human-like face, ears and eyes, three rows of teeth, and stings on various parts of the body, but especially on the tail, which caused it to be compared with the scorpion. Its

<sup>14</sup> Mammals of India, p. 7.

<sup>15</sup> Geographica, xv. 1, 37. Cf. J. W. M'Crindle's Megasthenes, p. 56.

<sup>16</sup> Hist. Anim., xvi. 41.

name records the fact that it was a man-eater (Persian *Mard-khor* in its archaic form), and this characteristic is also expressly stated by Ktesias. It was hunted by the natives, from the backs of elephants. Although it has been suggested by some commentators that it was the tiger, none of them appear to have seen how the several statements can be shown to be founded on actual facts. Pausanius, for instance, attributes these details to the imagination of the Indians, excited by dread of the animal. Others appear to be unwilling to regard the animal as being capable of identification. Thus Lassen, referring to Ktesias's assertion, that he had seen one of these animals with the Persian monarch, to whom it had been presented by the Indian king, asserts that "he cannot, in this instance, be acquitted of mendacity."<sup>17</sup>

Among facts not generally known, though mentioned in some works on Zoology, is one which I can state from my own personal knowledge is familiar to Indian Shikaris—it is that at the extremity of the tail of the tiger, as well as of other *felidae*, there is a little horny dermal structure like a claw or nail, which, I doubt not, the natives regard as analogous to the sting of the scorpion. Moreover, the whiskers of the tiger are by many natives regarded as capable of causing injury; and sportsmen know, where this is the case, that the skins of their slaughtered tigers are liable to be injured by the plucking out or burning off the whiskers—to avert accidents. The idea of the three rows of teeth probably had its origin in the three lobes of the carnivorous molar, which is of such a different type from the molars of ruminants and horses. The Martikhora was, therefore, I believe, the tiger, and the account of it embodies actual facts, though they were somewhat distorted in the telling.

It may be said that it would not be difficult to present an account of the tiger derived from the attributes and characteristics ascribed to the animal at the present day by the natives, which would have a far less substantial basis of fact than has the one given to us by Ktesias.

Aristotle gives an account of this animal, which account, he states, was taken from Ktesias.<sup>18</sup>

Megasthenes, according to Strabo, states with reference to tigers, that the largest are found among the Prasii (Sansk., *Prachyas*, i. e. Easterns), being nearly twice the size of the lion, and so strong that a tame tiger, led by four men, having seized a mule by one of the hind legs, overpowered it and dragged it to him.<sup>19</sup> Not a very remarkable performance, the Indian sportsman will remark, who knows what a tiger can do in the way of dragging heavy oxen for long distances over obstacles.

<sup>17</sup> Ancient India, by J. W. M'Crimble, p. 77.

<sup>18</sup> De Hist. Anim., ii. 1. *Vide postea*, p. 346.

<sup>19</sup> Geographica, xv. i. 37. Cf. Megasthenes, by J. W. M'Crimble, p. 66.

## 5. THE KROKOTTAS, or KYNOLYKOS (Κροκόττας, Κυνόλυκος).

*Hyæna crocuta*.—The Spotted Hyæna.

Ktesias, according to Photios,<sup>20</sup> describes the above animal as follows:—"There is in Ethiopia an animal called properly the Krokottas, but vulgarly the Kynolykos. It is of prodigious strength, and is said to imitate the human voice, and by night to call out men by their names, and when they come to fall upon them and devour them. This animal has the courage of the lion, the speed of the horse, and the strength of the bull, and cannot be successfully encountered with weapons of steel."

This I am disposed to identify (as from the references given by him in a foot-note, so also does Mr. M'Crindle) with the spotted hyæna (*H. crocuta*) of Africa—a very powerful animal—which, like its Indian relative (*H. striata*), has a hideous cry at night. It is, I believe, not conspicuous for courage; but according to some accounts the lion is less courageous in reality than is generally supposed. That however is a small matter. I cannot but think that Lassen<sup>21</sup> is wrong in identifying, on philological grounds, this animal with the jackal, the Sanscrit name for the latter being *Kottharaka* from *Kroshtuka*. This involves his saying, first, that the above were "fabulous attributes given to the jackal, an animal which frequently appears in Indian fables;" and, second, that the Ethiopia of Ktesias meant India. Cf. Appendix, p. 346.

## 6. THE GRYPHON, or GRIFFIN (Γρύψ).

*Canis domesticus*, var. *Tibetanus*.—Thibetan Mastiffs.

According to Ktesias, as related by Photios,<sup>22</sup> gold was obtained in certain "high towering mountains which are inhabited by the griffins, a race of four-footed birds, about as large as wolves, having legs and claws like those of the lion, and covered all over the body with black feathers, except only on the breast, where they are red. On account of these birds the gold, with which the mountains abound, is difficult to be got." Ælian's account of the same animals adds some probably spurious particulars—such as that the wings are white, the neck variegated with blue feathers, the beak like an eagle's, and that, according to the Baktrians, they built their nests of the gold which they dug out of the soil, but that the Indians deny this. He states that the auriferous region which the griffins inhabited was a frightful desert.

<sup>20</sup> Ecloga in Photii, Bibl. lxxii. Cf. Ancient India, by J. W. M'Crindle, pp. 32, 33.

<sup>21</sup> Ancient India, p. 75.

<sup>22</sup> Ecloga in Photii, Bibl. lxxii.



Taking Photios's account alone, and excluding from it the word birds, and for feathers reading hair, we have a tolerably accurate description of the hairy black-and-tan-coloured Thibetan mastiffs, which are now, as they were doubtless formerly, the custodians of the dwellings of Thibetans, those of gold miners as well as of others. They attracted the special attention of Marco Polo, as well as of many other travellers in Thibet; and for a recent account of them reference may be made to Capt. Gill's "River of Golden Sand."

They are excessively savage, and attack strangers fiercely, as I have myself experienced on the borders of Sikkim.

This identification serves also to clear up certain of the details in the story of Megasthenes and Herodotus, as to the gold-digging ants, which have been identified by Sir H. Rawlinson and Professor Schiern, as mentioned in the introductory remarks on p. 303, with Thibetan gold miners and their dogs. The former, on account of the great cold, are and were clad in furs, and it would appear, shared with the dogs in giving characteristics to the famous ants which were for so long regarded as a myth incapable of explanation. The "ants" which, according to Herodotus, were taken to Persia, and kept there, were, I believe, simply these mastiffs. He tells us<sup>23</sup> elsewhere that Tritantachmes, Satrap of Babylon, under the Achæmenians, "kept a great number of Indian dogs. Four large towns situated in the plain were charged with their support, and were exempted from all other tribute."

Larcher, in his history of Herodotus, quotes the following, without however noticing how far it aids in clearing the myth of the griffins:—"M. de Thon, an author worthy of credit, recounts that Shah Thamas, Sophie of Persia, sent to Suliman one of these ants in 1559. 'Nuntius etiam a Thamo oratoris titulo quidam ad Solimanum venit cum munere, inter quæ erat *formica indica*, canis mediocris magnitudine, animal mordax et sævum. Thuanus—Lib. xxiii.'"

Regarding the name griffin or gryphon, the Persian *giriften* (to gripe, or seize) is suggested by Mr. M'Crindle as the source. Hindustani contains several words thence derived, as *giriftar*, a captive; *girift*, seizure, &c. The Thibetans call their dogs *gyake*, or royal dogs, on account of their size and ferocity.

It may be added here, in its proper place, though already mentioned in the introductory remarks, that a passage in Pliny's account of the ants,<sup>24</sup> which has been the source of much difficulty to many who have discussed this question, admits, as I have elsewhere shown, of a satisfactory explanation. The passage is:—"Indicæ formicæ cornua, Erythris in æde Herculis fixa, miraculo fuere." The horn of the Indian ant was probably an example of the pickaxe even now in common use in Thibet. It is a sheep's horn fixed on a handle: this is, I think, more probable than that it was a horn taken from one of the skin garments worn by the Thibetan miners, as has been suggested by Professor Schiern.<sup>25</sup>

<sup>23</sup> Clio, lib. i. cap. xcii.

<sup>25</sup> Indian Antiquary, vol. iv. p. 231.

<sup>24</sup> Hist. Nat. lib. xi. cap. xxxi.

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## 7. Dog (Κύων).

*Canis and Cuon* (?)—Domestic and Wild Dogs.

There are various allusions by our authors to other dogs besides those which have been identified as the originals of the griffins. Thus Ktesias, according to Photios,<sup>26</sup> says that "the dogs of India are of great size, so that they fight even with the lion." This may possibly refer to the well-known fact that packs of wild dogs (*Cuon rutilans*) prove a match for the larger carnivora. There are numerous well authenticated cases of tigers having being killed by these dogs.

Ælian<sup>27</sup> relates that "Ktesias, in his account of India, says that the people called the Kynamologoi rear many dogs as big as the Hyrkanian breed; and this Knidian writer tells us why they keep so many dogs, and this is the reason: from the time of the summer solstice on to mid-winter they are incessantly attacked by herds of wild oxen, coming like a swarm of bees or a flight of angry wasps, only that the oxen are more numerous by far. They are ferocious withal and proudly defiant, and butt most viciously with their horns. The Kynamologoi, unable to withstand them otherwise, let loose their dogs upon them, which are bred for this express purpose; and these dogs easily overpower the oxen, and worry them to death. During the season when they are left unmolested by the oxen, they employ their dogs in hunting other animals. They milk the bitches, and this is why they are called Kynamologoi (dog-milkers). They drink this milk just as we drink that of the sheep or goat."

There is at present a tribe in India who are noted for keeping a large breed of dogs, which are most efficient in the chase. These are the *Labanos* or *Brinjaras*, who, by means of their pack cattle, perform most of the inland carriage in the hilly central regions of the peninsula. I have met their caravans, and also their fixed habitations in the central provinces bordering western Bengal, where they are very numerous. This general region is the one where the Kynamologoi (or Kynokephaloi) may be presumed to have dwelt. In Orissa there is a Rajah of a petty state who keeps a very fine breed of dogs, by means of which deer are run down, especially, as I was told, during the rainy season, when the softness of the ground prevents them from running so fast as they are able to do at other times. There are similar breeds also in other parts of India.

The "oxen" referred to were probably wild buffaloes, which still do much injury to the crops in some parts of India, and are a cause of terror to the natives.

<sup>26</sup> *Elogia* in Photii, Bibl. lxxii.

<sup>27</sup> *De Animal Nat.*, xvi. 31. Cf. *Anc. India*, by J. W. M'Crindle, p. 36.

8. DOLPHIN (Δελφίς).

*Platanista indi.*, Blyth. *Delphinus* (Sp.?)

Ælian<sup>20</sup> tells us that the "dolphins of India are reported to be of two sorts: one fierce, and armed with sharp-pointed teeth, which gives endless trouble to the fishermen, and is of a remorselessly cruel disposition; while the other kind is naturally mild and tame, swims about in the friskiest way, and is quite like a fawning dog; it does not run!! (*sic* in trans.) away when anyone tries to stroke it, and it takes with pleasure any food it is offered."

The first of these is probably the Indus species of the very curious genus of river porpoise (*Platanista*) which is found in India. The jaws are provided with numerous conical, recurved teeth. These porpoises are very destructive to fish, and are occasionally accidentally taken in nets. According to Jerdon,<sup>21</sup> they are speared by certain tribes of fishermen on the Ganges, who eat the flesh, and make oil from the blubber, which they use for burning.

The other dolphin mentioned by Ælian may, perhaps, be identified as a species of *Delphinus*, which often keeps company with vessels for long distances, though probably its tameness is somewhat exaggerated for the sake of contrast.

9. WHALE (Κῆτος).

*Balenoptera indica*, Blyth.—The Indian Fin-whale.

Ælian<sup>20</sup> tells us that "whales are to be found in the Indian sea; they are five times larger than the largest elephant. A rib of this monstrous fish measures as much as twenty cubits, and its lip fifteen cubits." Further on, he states that it is "not true that they come near the shore lying in wait for tunnies."

The rib, twenty cubits long, was probably really the ramus of a jaw, and the length given is therefore not excessive, since one in the Calcutta Museum, according to Jerdon,<sup>21</sup> from an individual eighty-four feet long, measured twenty-one feet; and it is said that specimens measuring up to one hundred feet have been stranded on the Indian coast. Rami of the jaws of whales are even now not uncommonly mistaken for ribs.

Since the species of this genus of whales feed on fish, the statement which Ælian denies was probably to some extent founded on actual observation.

<sup>20</sup> Hist. Anim. xvi. 18.

<sup>20</sup> Hist. Anim., xvi 12.

<sup>21</sup> Mammals of India, p. 159.

<sup>21</sup> Mammals of India, p. 161.

## 10. THE ELEPHANT ('Ελέφας).

*Elephas indicus*, Cuv.—The Indian Elephant.

There are, as might be expected, numerous allusions to the Elephant by Megasthenes, Arrian, and the author of the Periplus. Its mode of capture is described, as also are its training, its uses in the chase and in war, its habits, and certain peculiarities of its constitution. Some of these latter, as, for instance, those connected with the coming together of the sexes, are correct, though a myth in reference to this last exists even at the present day, and is very commonly believed by many.

The elephants of Taprobane (*i. e.* Ceylon) are distinguished, according to Ælian's account—derived perhaps from Megasthenes—as being larger, and more intelligent, than those of the mainland. The same author, too, describes a white elephant, and relates in reference to it a story of its devotion to its master.

The author of the Periplus mentions several ports, both in Africa and India, whence *elephas* (*i. e.* ivory) was an article of export, as we know it had been since the days of Solomon.

A very fair monograph of the habits and external characteristics of the elephant might be written from the facts recorded by the above authors, supplemented by such as are given by Strabo and Pliny.

## 11. THE KARTASONON AND THE INDIAN ASS (Καρτάζωνον, Ἰνδικὸς ὄνος).

*Rhinoceros indicus*, Cuv.—The Rhinoceros. *Gonda*, Hin.

The *Kartasonon* of Megasthenes and the Horned Ass of Ktesias, although separately described by Ælian as if they were distinct animals, appear to be both capable of identification with the rhinoceros. This fact has been already more or less generally accepted by writers, although some particulars, especially those as to the colour, have given rise to much discussion and argument. It seems probable that the Rhinoceros was also the original of the *monokeros*, or unicorn, which, as we have good cause to know, is usually represented as an Horned Ass. Ælian's<sup>22</sup> description of the *Kartasonon* is as follows:—  
“It is also said that there exists in India a one-horned animal, called by the natives the *Kartason*. It is of the size of a full-grown horse, and has a crest and yellow hair soft as wool. It is furnished with very good legs, and is very fleet. Its legs are jointless, and formed like those of the elephant; and it has a tail like a swine's. A horn sprouts out from between its eyebrows, and this is not straight, but

<sup>22</sup> Hist. Anim., xvi. 20, 21.

curved into the most natural wreaths, and is of a black colour. This horn is said to be extremely sharp. The animal, as I learn, has a voice beyond all example—loud, ringing, and dissonant.”

Photius’s<sup>33</sup> account of the “horned wild ass” of Ktesias agrees, in the main particulars, with one by Ælian.<sup>34</sup> That by the former is as follows: “Among the Indians there are wild asses as large as horses, some being even larger. Their head is of a dark-red colour, their eyes blue, and the rest of their body white. They have a horn on their forehead, a cubit in length (the filings of this horn, given in a potion, are an antidote to poisonous drugs). This horn, for about two palm-breadths upwards from the base, is of the purest white, where it tapers to a sharp point, of a flaming crimson, and in the middle is black. These horns are made into drinking-cups, and such as drink from them are attacked neither by convulsions nor by the sacred disease (epilepsy); nay, they are not even affected by poisons, if either before or after swallowing them they drink from these cups wine, water, or anything else. While other asses, moreover, whether wild or tame, and indeed all other solid-hoofed animals, have neither huckle bones (*astragulus*) nor gall in the liver, these one-horned asses have both. Their huckle bone is the most beautiful of all I have ever seen, and is in appearance and size like that of the ox. It is as heavy as lead, and of the colour of cinnabar, both on the surface and all throughout. It is an exceedingly fleet and strong animal, and no creature that pursues it, not even the horse, can overtake it,” &c.

Regarding the *astragulus*, or huckle-bone, the statement of its absence in solid-hoofed animals is incorrect, and I can offer no explanation of the reputed characteristics of that of the horned wild ass, except that an example seen by Ktesias had simply been dyed and weighted with lead. For short distances the rhinoceros can charge with great speed and force, and its voice is such as to merit to some extent the description by Megasthenes.

In reference to the colours of the animal, when I recall that I have often seen in India horses with tails and manes of a bright magenta, and with spots of the same colour all over their otherwise white bodies; that I have also seen elephants belonging to rajahs ornamented on their heads by the application of various pigments—I am led to conclude that the rhinoceros from which Ktesias’s description was taken was a domesticated one which, in accordance with the natives’ taste for bright colours, had been painted to take part in some pageant. Domesticated rhinoceroses are still kept by many natives; and they have, I believe, sometimes been trained like elephants to carry *howdahs*, with riders in them. I once met a native dealer in animals who had taken with him, for several hundred miles through the jungles, a rhinoceros, which he ultimately sold to the rajah of Jaipur, in

<sup>33</sup> *Elogia* in Photii, Bibl. lxxii. 25; Cf. *Anc. India*, by J. W. M’Crindle.

<sup>34</sup> *Hist. Anim.*, iv. 52.

**Madras.** He drove the animal before him, he told me, "as if it were a cow."

The horn of the rhinoceros is still held in much esteem by the natives of India, both for making into cups and for the preparation of a drug. They will pay sportsmen a high price for these horns, but are particular about obtaining the right article, as I learned from a gentleman who, as a speculation, brought a number of rhinoceros horns from Africa, but failed to dispose of them in the Calcutta bazaar.

Having thus offered an explanation of what has hitherto been a difficulty to commentators, I should not be surprised if evidence should be forthcoming to prove that it has been the custom with the natives to adorn with coloured pigments the cuirass-like hides of tame rhinoceroses.

Since the above paragraph was written, I have obtained sufficient confirmation of the correctness of this view, for, on turning to Rousselet's work on the Native Courts of India,<sup>35</sup> I find an account of a rhinoceros' fight at Baroda, which took place before the Gaikowar. The two animals were chained at opposite sides of the arena—one of them was *painted black, the other red*, in order that they might be distinguished, for otherwise they resembled each other in every point.

Ktesias' horned ass, therefore, had probably been whitewashed, and had had his horn painted blue and scarlet by his owner—who little foresaw what food for discussion and comment he was affording, by that simple act, to twenty centuries of philosophers and historians.

## 12. WILD HORSES AND ASSES (ἵπποι καὶ ὄνοι ἄγριοι).

*Equus onager*, Pallas.—Wild Ass of Cutch, &c.

According to Ælian<sup>36</sup> there are herds of wild horses and also of wild asses. "These interbreed, and the mules are of a reddish colour, and very fleet, but impatient of the yoke and very skittish. They say that they catch these mules with foot-traps, and then take them to the king of the Prasians, and that if they are caught when two years old they do not refuse to be broken in, but if caught when beyond that age they differ in no respect from sharp-toothed and carnivorous animals."

The mention of both horses and asses is no doubt due to the somewhat mule-like characters of the wild ass which is found in Western India, and is called *Ghor-khur* in Hindustani, and *Ghour* by the Persians. A closely allied species is the *Kiang* of Thibet. (*E. hemionus*, Pallas.) Even now by travellers they are sometimes spoken of as wild horses, but their neigh or bray, and tail, prove them to be true asses. In the Bikaner State, according to Dr. Jerdon, "once only in the year,

<sup>35</sup> L'Inde des Rajahs.

<sup>36</sup> Hist. Anim., xvi. 9. Cf. Megasthenes, by J. W. M'Crimble, p. 163.

when the foals are young, a party of five or six native hunters, mounted on hardy Sind mares, chase down as many foals as they succeed in tiring, which lie down when utterly fatigued, and suffer themselves to be bound and carried off. In general they refuse sustenance at first, and about one-third only of those which are taken are reared; but these command high prices, and find a ready sale with the native princes. The profits are shared by the party, who do not attempt a second chase in the same year, lest they should scare the herd from the district, as these men regard the sale of a few *Ghor-khurs* annually as a regular source of subsistence."<sup>27</sup>

### 13. THE PIG (ἄγρις).

*Sus indicus*, Schinz.—Indian Wild Boar.

Among statements by Ktesias which cannot be accepted, is the following, as related by Photios:<sup>28</sup>—"India does not, however, produce the pig, either the tame sort or the wild." Ælian in reproducing the same, adds that the "Indians so abhor the flesh of this animal that they would as soon taste human flesh as taste pork." Aristotle and Palladius also repeat the story of the absence of swine, which, if it had been true, would naturally suggest the inquiry how came the Indians to abhor the flesh, and, still more, how came the fact to be known? It is notorious that certain tracts of India at the present day do not contain wild pigs, and also that several large sections of the people detest the pig, and would not allow it to be kept in their villages. There are, however, some Hindus of high caste who will eat the flesh of the wild boar, and the Sind Emirs had pig preserves for purposes of sport. If other evidence were wanting that the pig is not a modern importation, and that the wild pig is not *feral*, appeal may be made to the fossil remains of pigs found in the Sivalik hills to show that it belongs to the ancestral fauna. Among some of the aboriginal and other tribes the keeping of pigs is, and probably always has been, a prevalent custom. Ancient Sanscrit writings would probably furnish evidence of the existence of pigs in India before the time of Ktesias.

### 14. SHEEP AND GOATS (Πρόβατα καὶ αἴγες.)

*Ovis et Capra.*

Both Photios<sup>29</sup> and Ælian state that the sheep and goats of India are bigger than asses. The former adds that they produce from four to six young at a time, and the latter that they never produce less than three, but generally four.

<sup>27</sup> Mammals of India, p. 237.

<sup>28</sup> Cf. J. W. M'Crimble's Ancient India, pp. 17, 46, 47.

<sup>29</sup> Ecloga in Photii, Bibl. lxxii. 13. Cf. Anc. India, by J. W. M'Crimble, p. 17.

All these statements are without foundation, for, although there are large breeds of goats peculiar to certain parts of India, they never approach the ass in size, and the sheep are particularly small. Ælian<sup>40</sup> alludes to the largeness of the tails, those of the sheep reaching to their feet, and the tails of the goats almost touching the ground. There are breeds of large-tailed sheep in Western India and Afghanistan called *Dumbas*, but I am unaware of the existence of any breed of goats which are remarkable in this respect. However in India some of the sheep are very goat-like and the contrary is also true. A wild goat of large size, said to be equal to an ordinary donkey, occurs in the western *ghats* and the Nilgiri hills. It is the *Hemitragus hylocrius* of Ogilby.

#### 15. THE AGRIOBOUS (Ἀγριοβούς.)

*Poephagus grunniens*, Linn.—The Yak.

The above name is that given by Kosmas Indikopleustes, a monkish traveller of the seventh century, to an animal which is most probably the same as one described by Ælian in the passage quoted below. Taking both of these accounts together, I do not hesitate to identify it with the Yak, which occurs not in India, but north of the Himalayan snow ranges. Yaks' tails are even at the present time a regular trade commodity, brought into India through Nepal and other frontier states, and they are much used by Indian potentates for various decorative purposes, insignia, &c., and from them are also made the more humble fly-whisks carried by horsemen.

Ælian says<sup>41</sup>:—"There is found in India a graminivorous animal (πομφάγων ζῷον), which is double the size of a horse, and which has a very bushy tail, very black in colour. The hair of this tail is finer than human hair, and its possession is a point on which Indian women set great store, for therewith they make a charming coiffure, by binding and braiding it with locks of their own natural hair. The length of a hair is two cubits, and from a single root there spring out in the form of a fringe somewhere about thirty hairs."

Ælian gives also a second and separate description of an animal shaped liked a satyr, covered all over with shaggy hair, and having a tail like a horse's. It was found in the mountains skirting the inland frontier of India, in a district called Korinda. When pursued it fled up the mountain sides, rolling down stones on its assailants. This, I think, was probably also the Yak. Compilers like Ælian have often mentioned the same object twice under different titles. "The animal itself is the most timid that is known, for should it perceive that anyone is looking at it, it starts off at its utmost speed, and runs right forward; but its eagerness to escape is greater than the rapidity of its

<sup>40</sup> De Animal Nat., iv. 32.

<sup>41</sup> Hist. Anim., xvi. 21.



pace. It is hunted with horses and hounds, good to run. When it sees that it is on the point of being caught, it hides its tail in some near thicket, while it stands at bay, facing its pursuers, whom it watches narrowly. It even plucks up courage in a way, and thinks that since its tail is hid from view the hunters will not care to capture it, for it knows that its tail is the great object of attraction. But it finds this to be, of course, a vain delusion, for someone hits it with a poisoned dart, who then flays off the entire skin (for this is of value), and throws away the carcass, as the Indians make no use of any part of its flesh."<sup>42</sup>

Kosmas describes it as "an animal of great size, belonging to India, and from it is got what is called the *toupha*, wherewith the captains of armies decorate their horses and their standards when taking the field. They say of it that if its tail be caught by a tree, it no longer stoops, but remains standing through its unwillingness to lose even a single hair. On seeing this, the people of the neighbourhood approach and cut off the tail, and then the creature flies off when docked entirely of its tail."<sup>43</sup>

#### 16. THE PHATTAGES (Φαττάγης).

*Manis pentadactyla*, Linn (?)—The Pangolin.

In Ælian's elsewhere quoted account of the animals of India,<sup>44</sup> which, from internal evidence, is considered by Schwanbeck, as pointed out by Mr. M'Crindle, to have been largely borrowed from Megasthenes, the following passage occurs:—

"In India there is an animal closely resembling the land crocodile, and somewhere about the size of a little Maltese dog. It is covered all over with a scaly skin, so rough altogether, and so compact, that when flayed off it is used by the Indians as a file. It cuts through brass, and cuts iron. They call it the *phattages*." It has been identified by Mr. M'Crindle with the pangolin, or scaly ant-eater. This identification may, perhaps, be correct; but I must confess to some reluctance in accepting it, since the *bajar kit*, as it is called in Sanscrit and Hindostani, seems scarcely to answer the description so well as would one of the land lizards, *Varanus*, or the water lizards, *Hydrosaurus*. In any case, the statement that the skins are used as a file capable of cutting metals must be regarded as apocryphal. The scales and flesh are used medicinally by the natives, being supposed to possess aphrodisiac properties.

<sup>42</sup> Hist. Anim., xvi. 11. Cf. M'Crindle's Megasthenes, p. 164.

<sup>43</sup> De Mundo, xi.

<sup>44</sup> Hist. Anim., xvi. 6. Cf. M'Crindle's Megasthenes, p. 163.

## BIRDS.

## 17. THE EAGLE ('Αετός)

*Aquila chrysaetos*, Linn.—Golden Eagle. Called *Birkut* in E. Turkestan; *Karakash*, in Kashgaria.

Ælian<sup>46</sup> writes, that "hares and foxes are hunted by the Indians in the manner following:—They do not require dogs for the purpose, but, taking the young of eagles, ravens, and of kites (or, as Lassen translates it, eagles, crows, and vultures), they rear and train them to pursue these animals, by subjecting them to a course of instruction, as follows," &c.

Lassen suggests that Ælian,<sup>46</sup> by mistake, substituted vultures for falcons. This is probable, since no true vulture could, by any amount of training, be taught to catch either a hare or a fox, the structure of their feet and claws being unadapted for the purpose. But the doubt expressed by the same author, as to whether eagles can be so taught, has been quite set at rest by a quotation from Sir Joseph Fayrer, made by Mr. M'Crinkle,<sup>47</sup> to the effect that when the Prince of Wales visited Lahore there were among the people collected about the Government House some Afghans, with large eagles, trained to pull down deer and hares. They were perched on their wrists like hawks.

It may be added, that the members of Sir Douglas Forsyth's mission to Yarkand and Kashgar, in 1872-3, brought back full accounts of the employment of golden eagles for the same purpose in those regions.

Further, Dr. Scully, in a Paper entitled, "A Contribution to the Ornithology of Eastern Turkestan,"<sup>48</sup> speaking of the golden eagle, says: "The trained bird is very common in Eastern Turkestan, every governor of a district usually having several. It is said to live and breed in the hills south of Yarkand, and near Khoten, where the young birds are caught, to be trained for purposes of falconry. . . . The trained *karakash* is always kept hooded when it is indoors, except when about to be fed, and the method of carrying it to the chase is the following: The man who is to carry the eagle is mounted on a pony, and has his right hand and wrist protected by a thick gauntlet. A crutch, consisting of a straight piece of stick, carrying a curved piece of horn or wood—the concavity being directed upwards—is attached to the front of the saddle; the man grasps the cross piece of the crutch with his gloved hand, and the eagle then perches on his wrist," &c.

<sup>46</sup> Ancient India, p. 43.

<sup>47</sup> Loc. cit., p. 97.

<sup>48</sup> Loc. cit., p. 81.

<sup>48</sup> Stray Feathers, vol. iv., 1876, p. 123.

18. THE BITTAKOS OR PRITTAKOS (Βίττακος, ψιττακός).

*Palæornis eupatrius*, Linn.—*P. Alexandri*, Auctorum.

Ktesias<sup>47</sup> describes the βίττακος as a bird which "has a tongue and voice like the human, is of the size of a hawk, has a red bill, is adorned with a beard of a black colour, while the neck is red like cinnabar; it talks like a man, in Indian; but if taught Greek, can talk in Greek also." This description serves to distinguish it from among the five or six species of parroquets which occur in India, and it may confidently be identified with the above-named species, which is the largest and most commonly domesticated of them all.

Ælian<sup>48</sup> says he was informed that there were "three species of σιττακός or ψιττακός, all of which, if taught to speak as children are taught, become as talkative as children, and speak with a human voice; but in the woods they utter a bird-like scream, and neither send out any distinct and musical note, nor, being wild and untaught, are able to talk."

19. THE EPOPS (Ἐποψ).

*Eupupa epops*, Linn.—The Indian Hoopoe.

The Indian hoopoe, according to Ælian,<sup>49</sup> "is reputed to be double the size of ours, and more beautiful in appearance; and while, as Homer says, the bridle and trappings of a horse are the delight of a Hellenic king, this hoopoe is the favourite plaything of the king of the Indians, who carries it on his hand, and toys with it, and never tires gazing in ecstasy on its splendour, and the beauty with which nature has adorned it. The Brachmanes make this particular bird the subject of a mythic story," &c.

The common hoopoe of Northern India is identical with the European bird. In Southern India there is a nearly allied, but smaller bird, *U. nigripennis*. There is, therefore, no foundation for Ælian's statement that the Indian bird is double the size of the European, it being unlikely that any other bird could have been intended.

It may be added, from Jerdon's "Birds of India," that "in captivity it is said to be readily tamed, and to show great intelligence and susceptibility of attachment. Mussulmans venerate the hoopoe on account of their supposing it to have been a favourite bird of Solomon, who is said to have employed one as a messenger."

<sup>49</sup> Ecloga in Photii, Bibl. lxxii. Cf. M'Crindle's *Ancient India*, p. 7.

<sup>50</sup> Hist. Anim., xvi. 1, 15.

<sup>51</sup> Hist. Anim., xvi. Cf. Megasthenes, by J. W. M'Crindle, p. 159.

## 20. THE KERKION (Κέρκιον).

*Eulabes religiosa*, Linn ; or *E. intermedia*, Hay.—The Hill Maina.

By Ælian<sup>52</sup> we are told "there is another remarkable bird in India: it is the size of a starling, is parti-coloured, and is trained to utter the sounds of human speech. It is even more talkative than the parrot, and of greater natural cleverness. So far is it from submitting with pleasure to be fed by man, that it has rather such a pining for freedom, and such a longing to warble at will in the society of its mates, that it prefers starvation to slavery with sumptuous fare. It is called by the Makedonians, who settled among the Indians in the city of Boukephala and its neighbourhood, and in the city called Kuro-polis, and others, which Alexander the son of Philip built, the *korkion*. This name had, I believe, its origin in the fact that the bird wags its tail in the same way as the water-ousels (οὐγκλοὶ)." *E. religiosa* in Southern India, *kokin maina*, which may be compared with *korkion*. If this handsome and most accomplished musician and talker be not the bird referred to by Ælian, then I can only suggest some of the other less remarkable species of mainas (*Acridotheres*).

## 21. GREEN-WINGED DOVE (Πελειάς χλωρόπτελος).

*Crocopus chlorigaster*, Blyth.—Green Pigeon.

The green pigeons of India, which fly in flocks, and feed upon fruit, are often a puzzle to strangers now, as they appear to have been to Megasthenes, or whatever other author it was from whom Ælian derived his information. He says:<sup>53</sup> "One who is not well versed in bird-lore, seeing these for the first time, would take them to be parrots and not pigeons. In the colour of the bill and legs they resemble Greek partridges."

There are several species of green pigeons in India; but the one mentioned above is the commonest, and has the widest distribution.

## 22. COCKS OF LARGEST SIZE (Ἀλεκτρυόνες μέγιστοι).

*Lophophorus impeyanus*, Lath.—Monal.

The monal pheasant must, I think, have sat for the following descriptive portrait by Ælian,<sup>54</sup> "There are also cocks which are of extra-

<sup>52</sup> Hist. Anim., xvi. 1.

<sup>53</sup> Hist. Anim., xvi. 1.

<sup>54</sup> Hist. Anim., xvi. 2.

Cf. J. W. M'Crindle. Megasthenes, p. 159.

Cf. J. W. M'Crindle. Megasthenes, p. 160; and Ancient India, p. 36.

ordinary size, and have their crests, not red, as elsewhere, or, at least, in our country, but have the flower-like coronals, of which the crest is formed, variously coloured. Their rump feathers again are neither curved nor wreathed, but are of great breadth, and they trail them in the way peacocks trail their tails, when they neither strengthen nor erect them; the feathers of these Indian cocks are in colour golden, and also dark blue, like the smaragdus."

It is probable that monal pheasants, captured in the Himalayas, were brought into India for sale, and thus became known to the Greeks. The same bird is, I believe, referred to under the name *Catreus* by Strabo,<sup>55</sup> where he quotes from Cleitarchus, and tells us that the bird was beautiful in appearance, had variegated plumage, and approached the peacock in shape. A suggestion that this was a bird of paradise is therefore absurd, and is otherwise most improbable, since birds of paradise are found not in India but in New Guinea. With this also I am inclined to identify "the partridge larger than a vulture," which, as related by Strabo,<sup>56</sup> on the authority of Nicolaus Damascenus, was sent by Porus, with other presents, in charge of an embassy, to Augustus Cæsar.

### 23. THE KELAS (Κήλας).

*Leptoptilos argala*, Linn.—The Adjutant.

In the following passage from Ælian, we may, I think, recognise the adjutant:—"I learn further, that in India there is a bird which is thrice the size of the bustard, and has a bill of prodigious size, and long legs. It is furnished also with an immense crop, resembling a leather pouch. The cry which it utters is peculiarly discordant. The plumage is ash-coloured, except that the feathers, at their tips, are tinted with a pale yellow."<sup>57</sup>

The pouch and long legs sufficiently identify this bird with the well-known characters of the adjutant.

## REPTILES.

### 24. TORTOISE (Χελώνη.)

*Trionyx*, Sp.? if a true river Tortoise.

In reference to this animal, Ælian<sup>58</sup> tells us that "it is found in India, where it lives in the rivers. It is of immense size, and it has a

<sup>55</sup> *Geographica*, xv. c. 1, § 69.

<sup>57</sup> *Hist. Anim.*, xvi. 4.

<sup>56</sup> *Geographica*, xv. c. 1, § 73.

<sup>58</sup> *Hist. Anim.*, xvi. 14.

shell not smaller than a full-sized skiff (σκάφη), which is capable of holding ten *medinni* (120 gallons) of pulse."

I have not been able to find any account of the maximum sizes to which the shells of the Indian species of *Trionyx* attain, but I believe they do exceed four feet. Ælian's account is too vague, and probably too much exaggerated, for any closer identification. There is a marine chelonian found in the Bay of Bengal, called *Dermatochelys coriacea*, the shell of which, according to Theobald, measures 66 inches over the curve.

It is difficult to suggest a name for the land tortoise, which Ælian describes as being the size of a clod of earth when turned by the plough in a yielding soil, as it might belong to several of the genera represented in Western India. He states that "they are said to cast their shells," which is of course an impossibility. He concludes by saying "they are fat things, and their flesh is sweet, having nothing of the sharp flavour of the sea-tortoise." An exact identification of this animal, so superior to the turtle, should prove of interest to aldermen.

## 25. THE SERPENT A SPAN LONG (Ὀφίς σπιθαμιαίος.)

*Eublepharis* Sp.—*Biscopra* of the natives.

Photios<sup>59</sup> and Ælian<sup>60</sup> describe, on the authority of Ktesias, a snake, which I feel unable to identify with any degree of certainty. The account by the former is the more concise of the two, and is as follows:—"In India there is a serpent a span long, in appearance like the most beautiful purple, with a head perfectly white, but without any teeth. The creature is caught on those very hot mountains whose rivers yield the sardine-stone. It does not sting, but on whatever part of the body it casts its vomit, that place invariably putrifies. If suspended by the tail, it emits two kinds of poison—one like amber, which oozes from it while living, and the other black, which oozes from its carcass. Should about a sesami-seed's bulk of the former be administered to anyone, he dies the instant he swallows it, for his brain runs out through his nostrils. If the black sort be given it induces consumption, but operates so slowly that death scarcely ensues in less than a year's time."

The lizard named above, the *Biscopra* of the natives, though toothless, is regarded as being very poisonous, and on this account I suggest, but with hesitation, that it may be the animal. It may, however, have been a true snake.

## 26. THE SKOLEX (Σκώληξ).

*Crocodilus*, vel *Gavialis*.—The Crocodile, or Garial.

Several authors who have derived their information from Ktesias give accounts of the *Skolex*. The most complete is that by Ælian<sup>61</sup>

<sup>59</sup> Ecloga in Photii, Bibl. lxxii. 16.

<sup>60</sup> Hist. Anim., iv. 36. Cf. Anc. India, by J. W. M'Crindle, p. 48.

<sup>61</sup> De Nat. An., v. 3; Cf. Anc. Ind., by J. W. M'Crindle, pp. 7, 23, 27, 56, 58.

as follows:—"The river Indus has no living creature in it except, they say, the *Skoler*, a kind of worm, which to appearance is very like the worms that are generated and nurtured in trees. It differs, however, in size, being in general seven cubits in length, and of such a thickness that a child of ten could scarcely clasp it round in his arms. It has a single tooth in each of its jaws quadrangular in shape, and above four feet long. These teeth are so strong that they tear in pieces with ease whatever they clutch, be it a stone or be it a beast, whether wild or tame. In the daytime these worms remain hidden at the bottom of the river, wallowing with delight in its mud and sediment, but by night they come ashore in search of prey, and whatever animal they pounce upon, horse, cow, or ass, they drag down to the bottom of the river where they devour it limb by limb, all except the entrails. Should they be pressed by hunger they come ashore even in the daytime; and should a camel then, or a cow, come to the brink of the river to quench its thirst, they creep stealthily up to it, and with a violent spring, having secured their victim by fastening their fangs in its upper lip, they drag it by sheer force into the water, where they make a sumptuous repast of it. The hide of the *Skoler* is two finger-breadths thick. The natives have devised the following methods for catching it. To a hook of great strength and thickness they attach an iron chain, which they bind with a rope made of a broad piece of cotton. Then they wrap wool round the hook and the rope, to prevent them being gnawed through by the worm, and having baited the hook with a kid, the line is thereupon lowered into the stream. As many as thirty men, each of whom is equipped with a sword, and a spear (harpoon), fitted with a thong, hold on to the rope, having also stout cudgels lying ready to hand, in case it should be necessary to kill the monster with blows. As soon as it is hooked and swallows the bait, it is hauled ashore, and dispatched by the fishermen, who suspend its carcass till it has been exposed to the heat of the sun for thirty days. An oil all this time oozes out from it, and falls by drops into earthen vessels. A single worm yields ten *kotulai* (about five pints). The vessels having been sealed up, the oil is despatched to the king of the Indians, for no one else is allowed to have so much as one drop of it. The rest of the carcass is useless. Now, this oil possesses this singular virtue, that if you wish to burn to ashes a pile of any kind of wood, you have only to pour upon it half a pint of the oil, and it ignites without your applying a spark of fire to kindle it; while if it is a man or a beast you want to burn, you pour out the oil, and in an instant the victim is consumed. By means of this oil also the king of the Indians, it is said, captures hostile cities without the help of rams or testudos, or other siege apparatus, for he has merely to set them on fire with the oil and they fall into his hands. How he proceeds is this: Having filled with the oil a certain number of earthen vessels, which hold each about half a pint, he closes up their mouths and aims them at the uppermost parts of the gates, and if they strike them and break, the oil runs down the woodwork, wrapping it in flames

which cannot be put out, but with insatiable fury burn the enemy, arms and all. The only way to smother and extinguish this fire is to cast rubbish into it. This account is given by Ktesias the Knidian."

As regards the *Skolex*, I think we need not hesitate to identify it with the crocodile—the nature of the bait, a kid, used in its capture sufficiently proves that—in spite of the incorrect description of the animal itself; but although the oil of crocodiles is sometimes extracted and applied to various medicinal and other purposes by native fishermen, the substance here described, and to which this origin was ascribed, was probably petroleum, the true source of which was not well understood, although Ktesias elsewhere refers to a lake upon the surface of which oil floated.

As is pointed out on p. 333, the supposed product of the *dikaïron* was probably *Churru*s (Indian hemp), so I would suggest that the *Skolex* oil was petroleum from the Punjab<sup>62</sup> oil springs, where it appears to have been well known and held in high esteem for its various properties since the earliest times. Ktesias's account confers upon it characteristics which were probably somewhat exaggerated. They may be compared with those of substances not unknown at the present day to persons of the Nihilist and similar fraternities. We have it on record, however, that fire-balls, prepared with Punjab petroleum, were employed as missiles to frighten the war elephants of a Hindu king by a Mahomedan invader eight hundred years ago. In their accounts the Mahomedan historians make use of a word signifying naphtha, so that gunpowder was not intended, as has sometimes been supposed.<sup>63</sup>

When carried as far as Persia, away from its source, it probably acquired the mythical origin described by Ktesias; and the account of the animal itself was so distorted that the Greeks did not recognize the same animal as the crocodile of the Nile, which was of course known to them. At the same time it should be remembered that the Garial (not Gavial, as it is incorrectly called) occurs in the Indus, and would, no doubt, seem a strange animal even to people well acquainted with the crocodile of the Nile.

Another mention of Indian crocodiles is to be found in the Periplus, where it is said that, when approaching the Sinthus (i. e. Indus) river, "the sign by which voyagers, before sighting land, know that it is near, is their meeting with serpents (sea snakes) floating on the water; but higher up, and on the coasts of Persia the first sign of land is seeing them of a different kind, called *graa*i" (Sansk., *graha*, a crocodile).<sup>64</sup>

<sup>62</sup> Cf. Economic Geol. of India, p. 126.

<sup>63</sup> See Jour. Soc. Arts, April 28, 1882, p. 595.

<sup>64</sup> Cf. Periplus of the Erythrean Sea, by J. W. M'Crimdell, p. 107.



27. SERPENT ("Οφίς).

*Python molurus*, Linn.—The Python.

Pliny<sup>65</sup> tells us that, according to Megasthenes, "serpents in India grow to such a size that they swallow stags and bulls whole."

This is a somewhat exaggerated account of the capabilities of the Indian python, which is, however, sometimes thirty feet long, and three feet, or even more, in circumference. That it can kill and eat deer seems to be a well-attested fact, though how it would dispose of one with horns I cannot say. I know of one story recorded by an Englishman,<sup>66</sup> where in Sambalpur the natives were in the habit of tethering goats near some rocks occupied by a monster snake, as an offering, which he very freely accepted and disposed of.

There is an account by Capt. E. A. Langley<sup>67</sup> of an encounter between one of these snakes of the above dimensions and a sportsman, whose dog was first killed by the snake. After it had been shot, a dead deer was found, which it had been about to swallow when disturbed by the dog.

The stories of monster snakes killing and eating horned cattle seem more than doubtful.

28. ("Οφίς θαλάσσιος).

*Hydrophis*, Sp. (?)—Sea-snakes.

The sea-snakes of the Indian seas are thus referred to by Ælian:<sup>68</sup> "The Indian sea breeds sea-snakes, which have broad tails, and the lakes breed hydras (crocodiles?) of immense size; but these sea-snakes appear to inflict a bite more sharp than poisonous."

The species of *Hydrophis* have broad tails, as described by Ælian; but he underrates the effects of their bite; for although, as Mr. Theobald<sup>69</sup> states, "their fangs are small, their venom is extremely potent."

They may be seen swimming in numbers near some parts of the coast of the peninsula of India and the islands of the Bay of Bengal. I have taken them in a net towed from the deck of a steamer; and on one occasion, on the island of Prepara, I came upon an eagle (*Cuncuma lecoogaster*) in the act of eating one; quite a pile of snake bones being at the foot of what was evidently his favourite perch.

Ælian's *hydras* I cannot identify, unless they be crocodiles; but these he elsewhere describes, under the name *skolex*. (See p. 326.)

<sup>65</sup> Hist. Nat., viii. 14, 1.

<sup>66</sup> Motte in Asiatic Annual Register, London, 1766.

<sup>67</sup> Narrative of a Residence at the Court of Meer Ali Moorad.

<sup>68</sup> Hist. Anim., xvi. 2, 8. Cf. Megasthenes, by J. W. M'Crindle, p. 163.

<sup>69</sup> Catalogue of Reptiles of British India, Appendix, p. 2.

Although I am not yet prepared to identify the fish, crustaceans and mollusca, which are mentioned by our Greek authors, owing to the vagueness of the descriptions, I anticipate some success with them hereafter, but am compelled to reserve that part of the subject for the present, and therefore pass now to the insects.

## INSECTS.

### 29. HONEY (Μέλι).

*Apis dorsata* (?)—Bees. *Bonhra*, Hin.

Photios tells us, on the authority of Ktesias,<sup>70</sup> that "there is a certain river flowing with honey out of a rock, like the one we have in our own country."

I venture to think that this story may have possibly originated in the fact that the rocky gorges of many Indian rivers are the favourite haunts of wild bees. To those who know India, the famous marble rocks on the Narbada will suggest themselves; and all who have actually visited that remarkable gorge where the river is bounded by lofty cliffs of pure white marble, will remember the ladders which hang suspended from the summits, by which the honey-seekers descend to rob the combs. What more natural than that honey brought from such a spot should be made the object of a story like that related by Ktesias.

Perhaps we may venture a step further, and suggest that the following statement, by Strabo,<sup>71</sup> quoting from Megasthenes, had the same origin:—"Stones are dug up in India which are of the colour of frankincense, and sweeter than figs or honey." But the probability of some form of sugar-candy, the true origin of which was then unknown, having given rise to this story, should not be forgotten (*cf.* p. 335).

### 30. THE INDIAN MURMEX (Μύρμηξ ὁ Ἰνδός).

*Termes*, *Sp.* (?)—Termites, or White Ants.

The termites, or white ants, as distinguished from the gold-digging ants, receive special attention at the hands of Ælian, whose account appears to have been derived from an author named Iobas. He says: "Nor must we forget the Indian ant, which is so noted for its wisdom. The ants of our country do, no doubt, dig for themselves subterranean holes and burrows, and by boring provide themselves with lurking

<sup>70</sup> Ecloga in Photii, Bibl. lxxii. 13 (καὶ ποταμὸν φησιν ἐκ πέτρας ῥέοντα μέλι).

<sup>71</sup> Geographica, xv. c. 1, § 37.

places, and wear out all their strength in what may be called mining operations, which are indescribably toilsome, and conducted with secrecy; but the Indian ants construct for themselves a cluster of tiny dwelling-houses, seated, not on sloping or level grounds, where they could easily be inundated, but on steep and lofty eminences,"<sup>73</sup> &c., &c.

The above with its context affords a good description of Indian white ants, or termites, which, unlike true ants, have soft, defenceless bodies, and have therefore to protect themselves by their earthworks. Besides constructing the well-known so-called ant-hills, they, when extending the range of their foraging grounds, protect every step of their progress by covered passages, built up of minute pellets of moistened clay.

31. **ELEKTRON** (Ἠλεκτρον) (Θηρία τὸ μέγεθος ὅσον γίνονται ἀντὶ κανθαροί).

*Coccus lacca*.—The Lac Insect, and its Products, Shell Lac and Lac Dye.

None of the commentators on the ancient accounts of India appear to have suggested that the *elektron*, to which reference is not unfrequently made, can be identified with a known production of India. Lassen, however, suggested that it was a gum exuding from trees. There are several points in the following descriptions which point with certainty to the fact that it was crude shell-lac, which is a secretion that surrounds the female lac insect, whose body forms the material of lac dye.

From Photios's extracts, as given by Mr. M'Crindle,<sup>73</sup> we learn that, "Through India there flows a certain river, not of any great size, but only about two stadia in breadth, called in the Indian tongue, Hyparkhos (Ἰπάρχος), which means in Greek, φέρων πάντα τὰ ἀγαθὰ (i. e. the bearer of all good things). This river, for thirty days in every year, floats down amber, for in the upper part of its course, where it flows among the mountains, there are said to be trees overhanging its current which for thirty days, at a particular season in every year, continue dropping tears like the almond tree, and the pine tree, and other trees. These tears, on dropping into the water, harden into gum. The Indian name for the tree is *Siptakhora* (Σιπτάχορας),<sup>74</sup> which means, when rendered into Greek, γλυκὺς (i. e. sweet). These trees, then, supply the Indians with their amber. And not only so, but they are said to yield berries, which grow in clusters like the grapes of the vine, and have stones as large as filbert nuts of Pontos."

Further on we read: "In the same parts there is a wild insect, about the size of a beetle, red like cinnabar, with legs excessively long.

<sup>73</sup> Hist. Anim., xvi. 15. Cf. Megasthenes, by J. W. M'Crindle, p. 167.

<sup>74</sup> Ancient India, by J. W. M'Crindle, pp. 20, 21.

<sup>75</sup> *Aphytactora*, according to Pliny, Nat. Hist., xxxvii. 11.

It is soft as the worm called *skôlex*, and is found on the trees which produce amber, eating the fruits of those trees, as in Greece the wood-louse ravages the vine-trees. The Indians grind these insects to a powder, and therewith dye such robes, tunics, and other vestments as they want to be of a purple hue." Speaking of the race Kynokephaloi, they are said to "eat the fruit of the *Siptakhora*, the tree which produces amber, for it is sweet. They also dry this fruit, and pack it in hampers, as the Greeks do raisins. The same people construct rafts, freight them with the hampers as well as with the flowers of the purple plant (*vide* p. 344), after cleansing it, and with 260 talents weight of the dried fruits, and a like weight of the pigment which dyes purple, and 1000 talents of amber. All this cargo, which is the season's produce, they convey annually as tribute to the king of the Indians."

In spite of exaggeration, in the account above given of the red insects, I think they may be safely identified with the so-called lac insects, *Coccus lacca*. They cannot have been cochineal insects, as has been suggested, since they do not occur in India. The *elektron* was certainly shell-lac, as above stated. The *Periplus* mentions *Λάκκος χρωμάτων*, coloured lac, as an export to Adouki from Ariakê, which, whether it means the dye itself, or garments coloured by it, as has been suggested, sufficiently proves that the substance was known at that early time. The *Siptakhora* tree presents some difficulty, owing to its combining attributes belonging to two distinct trees, which, however, grow in the same region. The tree which most abundantly yields lac is the *Khusum*—*Schleichera trijuga*. It is found on others too; but not, so far as my experience goes, on the *Mhowa* (*Bassia latifolia*), the dried flowers of which are brought down from the mountainous regions in baskets for sale in the plains. The flowers are used both as food and in the manufacture of a spirit, the well-known *Mhowa* spirit.<sup>75</sup> It is possible that some of the confusion may have arisen from the fact that the *Mhowa*, like other trees belonging to the same natural order, does exude a gum. The fruit of the *Khusum*, though edible, is not so treated. The *fruits* of the *Mhowa* include stones, and grow in clusters.

These identifications, taken together with the statement of Pliny, that the Hyparkhos, or Hypobaros river flows into the Eastern Sea, enable us, I think, so far to localise it as to say, that it was one of those which rise in Western Bengal (or Orissa), and among them it may have been either the Damuda, the Dalkissar, Kossai, Brahmini, or Mahanadi. Possibly the old native names of these, which I cannot at the moment refer to, may help to elucidate the identification.

As for the race called Kynokephaloi, they are subjects fit for separate examination, it being here sufficient to suggest that they were a Kolarian race.

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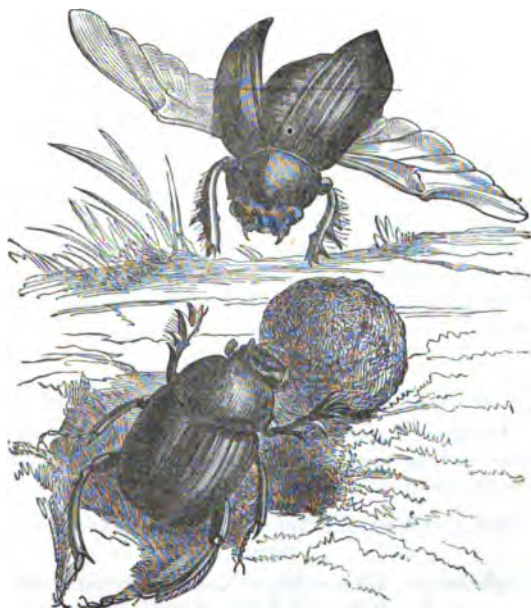
<sup>75</sup> Cf. *Jungle Life in India (passim)*.

32. THE DIKAIIRON (Δίκαιρον).

*Scarabæus sacer*, Linn. (?)—The Dung Beetle.

Under the name *Dikaiiron*, Ktesias described, according to Photios<sup>76</sup> and Ælian,<sup>77</sup> a bird! of the size of a partridge's egg, which buried its dung in the earth. To this dung, which was said to be an object of search, the properties of an opiate and poison were attributed. It was so precious that it was included among the costly presents sent by the king of the Indians to the Persian monarch, and no one in Persia possessed any of it except the king and his mother.

By the Greeks it was called δίκαιον (i. e. just), that being probably the nearest approximation of a known word to the Indian or Persian name. This so-called bird! was, I believe, one of the *Coprophagi* of Latreille, namely, the common dung beetle called *Gobaronda* in Hindustani, which buries pellets of cattle droppings as a receptacle for its eggs and food for the larvæ when hatched.



*Scarabæus sacer*.—Linn.

I do not know whether these pellets are used medicinally, though it is not improbable that they are, but I strongly suspect that the substance, described by Ktesias, to which he has attributed this origin

<sup>76</sup> *Ecloga*. in Photii, Bibl. lxxii. 17.

<sup>77</sup> *De Nat. An.*, iv. 41.

was *Churru*, a resinous product of Indian hemp (*Cannabis sativa*). It cannot have been opium, as it was not introduced into India till a later period.

I remember when in the valley of the Indus being very much struck with the rapidity with which these scarabæi formed pellets from cattle droppings and rolled them across the sand to suitable spots for burying. The pellets are often larger than the beetles themselves, and the method of rolling them is curious, as the beetle goes backwards, guiding the ball with his long hind legs and walking on the two pairs of fore-legs.

The foregoing illustration, for which I am indebted to Messrs. Cassell & Co., though not representing this attitude, will aid the reader towards understanding the origin of this myth.

It would not be difficult to give examples of almost as extravagant ideas of the origin of many of our drugs which were till recently accepted. There are some even to the present day the true source of which is unknown.

The above may be compared with the suggestion on page 328, that the oil of the *skolex* was in reality rock oil or petroleum from the Punjab.

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## PLANTS.

It would be going beyond the special limits of this Paper to attempt any discussion as to the identity of plants mentioned by our authors, but not belonging to India. I should not possess in such an analysis the qualification which has been of so much aid to me with reference to the productions of India, namely, a, so to speak, personal acquaintance with them as they appear, and are regarded by the natives in the country itself.

### 1. RICE (\*Ορυζα).

*Oriza sativa*, Linn.—Rice.—(Sansk. *Vrihi*).

In the *Periplus*, we are told that *oriza*, which all agree was rice, was produced in Oraia and Araikê, and was exported from Barugaza to the Barbarine markets and the Island of Diskorides, *i. e.* Socotra.

### 2. HONEY FROM CANES CALLED SUGAR (Μέλι τὸ καλάμινον τὸ λεγόμενον σαχαρ).

*Saccharum officinarum*, Linn.—Sugar Cane, its product called *Sarkara* in Sanskrit, and *Sukkar* by the Arabs.

According to the *Periplus* it was exported from Barugaza (*i. e.* Bharoch), to the markets of Barbaria.

Mr. M'Crindle's<sup>78</sup> *résumé* of the writings of the ancients with regard to this substance is of such interest that I quote it *verbatim* here :

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<sup>78</sup> *Periplus of the Erythræan Sea*, by J. W. M'Crindle, p. 23.

"The first western writer who mentions this substance is Theophrastos, who continued the labours of Aristotle in Natural History. He called it a sort of honey extracted from reeds. Strabo states, on the authority of Nearkhos that reeds in India yield honey without bees. Ælian (*Hist. Anim.*) speaks of a kind of honey pressed from reeds which grew among the Prasi. Seneca (Epist. 84) speaks of sugar as a kind of honey found in India on the leaves of reeds, which had either been dropped on them from the sky as dew, or had exuded from the reeds themselves. This was a prevalent error in ancient times, *e. g.* Diskorides says that sugar is a kind of concreted honey found upon canes in India and Arabia Felix; and Pliny, that it is collected from canes like a gum. He describes it as white, and brittle between the teeth, of the size of a hazel nut at most, and used in medicine only. So also Lucian, alluding to the Indians near the Ganges, says that they quaff sweet gums from tender reeds."

It has been conjectured that the sugar described by Pliny and Dioskorides was sugar-candy obtained from China." See page 330, where I have suggested that this was the origin of the "stones sweeter than figs or honey," which were supposed to have been dug out of the earth.

### 3. Φλοιός.

*Papyrus pangorei*, Nees. (?)—*Papyrus* Reed.

According to Herodotus<sup>79</sup> "the Indians wear garments (ἱσθῆτες φλόιναι) made from a plant which grows in the rivers. Having collected and beaten it, they interweave it in the form of a mat, and they clothe themselves with it after the manner of a cuirass."

The above-named species of papyrus is commonly used for weaving into mats, and is sometimes used by fishermen as a protection for their bodies from wet and cold. In some respects the description would suit either hemp (*Cannabis sativa*, Linn.) or jute (*Corchorus capsularis*, Linn.); but on the whole I cannot accept that it was the fibre of either of these to which Herodotus refers, especially as regards hemp, since he elsewhere<sup>80</sup> describes its use by the Skythians, and compares its qualities with those of flax.

If not the papyrus, it was probably one of the other species of marsh plants<sup>81</sup> of which mats are made in India at the present day. "The luxuriance of the grasses and reeds in Sind," says Captain Langley,<sup>82</sup> "especially near the Indus, surpasses anything I ever saw elsewhere. The reed known as *kana* grows to an immense height, is notched like the bamboo, and has a beautiful feathery head. This reed is invaluable to the Sindians for huts, mats, baskets, chairs, &c.

<sup>79</sup> Phalio, III. cap. xcviii. <sup>80</sup> Phalio, III. cap. ccii., & IV. caps. lxxiv., lxxv.

<sup>81</sup> *Saccharum naya*, Roxb., and *S. spontaneum*, Linn., &c. &c.

<sup>82</sup> Narrative of a Residence at the Court of Meer Ali Moorad, vol. i. p. 275.

It grows in large tufts, and vast tracts are covered with it between Khyrpur and the river." This *kana* (*Typha elephantina*, Roxb.) could certainly not have been the plant from which canoes were made, as has been suggested by some of the critics.

For purposes of mere flotation it is used by fishermen and others when dried and tied in bundles, but the suggestion that the boats capable of holding several persons, mentioned by Herodotus, were made of it, is obviously absurd.

#### 4. THE INDIAN REED (Κάλαμος Ἰνδικός).

*Borassus flabelliformis*, Linn.—The Palmyra Palm.

It appears to have been calmly accepted by commentators that "the Indian reed," referred to by Grecian and Latin authors, was the same as the plant to which we give the name bamboo. So far as I have read their writings, excepting the alternatives mentioned below, I have not met with any suggestion that this identification is incorrect.<sup>83</sup> To show in the first place that it is so, and secondly to name a plant which fulfils the required conditions, is however not difficult.

The facts that the bamboo does not attain more than about one-third of the size of the so-called reed; that it could not, therefore, have been used for the purposes for which the Indian reed is said to have been employed, and the absence of the larger kinds of bamboo from the region of the lower Indus valley, all combine to prove that the above identification of the commentators must be rejected.

The more important among the numerous references to the Indian reed are the following:—Herodotus<sup>84</sup> speaks of the inhabitants of the marshes, which are formed by the flooding of rivers in India, as fishing from canoes formed of canes, which are cut from node to node, each segment forming a boat. Pliny<sup>85</sup> gives a similar account, and says that these boats traverse the Accesines (i. e. Chenab river). So also Diodorus Siculus,<sup>86</sup> who has written to the following effect:—"In India the lands bordering rivers and marshes yield reeds of prodigious size. It is all that a man can do to embrace one. Canoes are made from them."

Ktesias's account, as given by Photios,<sup>87</sup> is that the Indian reed grows along the course of the Indus, and that it is "so thick that two men could scarcely encompass its stem with their arms, and of a height equal to that of a mast of a merchant ship of the heaviest burden. Some are of a greater size even than this, though some are of less, as might be expected, since the mountain it grows on is of vast range.

<sup>83</sup> Sprengel includes the rattan, *Calamus rotang*, in his identification. This is, if possible, a plant still more unsuited to the requirements of the case.

<sup>84</sup> *Thalie*, book III., xviii.

<sup>85</sup> *Hist. Nat.*, lib. VII., cap. ii., tom. i, p. 372, line 22; and lib. XVI., cap. xxxvii. tom. ii., p. 27, line 32.

<sup>86</sup> *Bibl.*, lib. II., § xvii., p. 132.

<sup>87</sup> *Cf.* *Ancient India*, by J. W. M'Crinde, p. 10.



The reeds are distinguished by sex, some being male and others female. The male reed has no pith and is exceedingly strong, but the female has a pith."<sup>88</sup> Tzetes,<sup>89</sup> Theophrastus,<sup>90</sup> and Strabo<sup>91</sup> are other authors who treat of this subject. I have on the preceding page given an account of the *kana* reed (*Typha elephantina*, Roxb.), which has been suggested as an alternative with the bamboo by Lassen; but although, as stated, bundles of its slender stalks, when dried, are used for mere purposes of flotation on the Indus, it cannot have been made into canoes.

Statements made by Lassen and Sprengel, that the bamboo sometimes has a diameter of two feet, are quite incorrect. Nine inches is an extreme and very exceptional limit,<sup>92</sup> and as the larger species of bamboo do not occur near the Indus, on account of their only flourishing in moist tropical climates, we must look to some other tree as having furnished, when the stem was split, almost ready-made boats capable of holding several people. At the present day, excluding timber dug-outs, made of *Bombax*, &c., the only trees so employed are palms; and among the species so used, namely the cocoanut, the date-palm, and the palmyra, (*Borassus flabelliformis*, Linn.), I should be inclined to give the preference to the latter, as it is cultivated in Lower Sind. The diameter of a full-grown tree is from 18 to 24 inches, or the circumference is, say, six feet at the base; the height is from 40 to 60 feet, and in favourable localities, as in Burma, 100 feet. Canoes, capable of holding two or three people, are made from the stems of this palm in many parts of India at the present day. It is noteworthy, moreover, that the Sanscrit name is *Trinaraja*, i. e. king of the grasses or reeds. The *Phoenix dactylifera*, or date-palm, which is now the common palm in the Indus valley, attains a height of 100 to 120 feet, and the trunks of male trees are, I believe, used for canoes; but if, as is stated by Brandis,<sup>93</sup> it was only introduced into Sind in the eighth century, it cannot have been the tree mentioned by our ancient authors.

## 5. THE NAUPLIUS (Ναύπλιος).

### *Cocos nucifera*.—The Indian Cocoanut

Under the name Nauplius, which Müller suggests, as stated by Mr. M'Crindle, is a mistake for *ναργυλιος* (the Arabian *narigil*, or Sanskrit *ndrikela*), the author of the Periplus,<sup>94</sup> refers to the cocoanut, while Kosmas<sup>95</sup> gives a very good description of it, under the name *argellia*, evidently a transliteration of the native name minus the initial *n*.

<sup>88</sup> Cf. Ancient India, by J. W. M'Crindle, p. 10.

<sup>89</sup> Chil. vii., v. 739, from third book of 'Αραβικιον of Uranius.

<sup>90</sup> Plant Hist., ix. 11.

<sup>91</sup> Ibid. xv. 21.

<sup>92</sup> Brandis' Forest Flora, p. 554, gives for the stems of *Bambusa arundinacea*, Retz, diameters varying from four to nine inches.

<sup>93</sup> Forest Flora, p. 553.

<sup>94</sup> The Erythraean Sea, by J. W. M'Crindle, p. 26.

<sup>95</sup> Ancient India, p. 95.

## 6. THE PAREBON TREE (Πάρηβον).

*Ficus religiosa*, Linn.—The *Pipal*, Hin.

The *parebon* tree, as described by Ktesias, according to Photios,\*\* was “a plant about the size of the olive, found only in the royal gardens, producing neither flower nor fruit, but having merely fifteen roots, which grow down into the earth, and are of considerable thickness, the very slenderest being as thick as one’s arm. If a span’s length of this root be taken it attracts to itself all objects brought near it (πάντα ἔλκει πρὸς ἑαυτήν), gold, silver, and copper, and all things except amber. If, however, a cubit’s length of it be taken, it attracts lambs and birds, and it is, in fact, with this root that most kinds of birds are caught. Should you wish to turn water solid, even a whole gallon of it, you have but to throw into it but an obol’s weight of this root, and the thing is done. Its effect is the same upon wine, which, when condensed by it, can be held in your hand like a piece of wax, though it melts the next day. It is found beneficial in the cure of bowel disorders.”

My reasons for identifying the above with the *pipal* tree (*Ficus religiosa*) are as follow:—Though of common occurrence in the moist tropical parts of India, it is seldom found except where cultivated in gardens and plantations in the Punjab and the arid tracts of Northern India generally, where, as it does not flourish, it is probably not often larger than a well-grown olive tree.

Its small figs are inconspicuous, scarcely exceeding the larger varieties of peas in size, so that it might easily have been supposed to have had neither flowers nor fruit. Its roots sometimes clasp other trees in their embrace, and they are generally visible at the surface of the ground for some distance away from the trunk. There is no limit, however, to their number.

Being regarded as sacred by the Hindus, offerings of various emblems and idols are often to be seen placed round the trunk; in some cases ancient stone implements and other stones of curious and grotesque shapes may be observed thus collected around it. In these facts I would suggest that the myth as to the attractive power of the roots, or, as Apollonius has it, the tree itself, for metals and stones, may very probably have originated.

Its “attractive” power for birds and other animals is very readily explained, since from the glutinous juice which exudes from the stem bird-lime is commonly made; and it may be that the “attraction” for metals, &c., merely adheres to some adhesive substance prepared from this juice. The effects of the fresh juice when dropped into water or wine might possibly be to thicken them, but perhaps not to

\*\* Ecloga in Photii, Bibl. lxxii. Cf. Ancient India, by J. W. M’Crindle, p. 20.

the extent stated by Ktesias. As to the medicinal properties, the seeds are believed to be cooling and alterative, and the leaves and young shoots are used as a purgative.

To the above, which constitute strong reasons in favour of this identification, there may be added, that although at first sight the name *pipal* presents no very close resemblance to *parebon*, still, when written as it is often pronounced, *paepun*, the *l* being replaced by *n*, it is not difficult to understand how the sound may have suggested to the ear of the Greek writer a combination of letters which he represented by *πάρηβον*.

7. TREES BEARING WOOL (τὰ δὲ δένδρεα τὰ ἄγρια αὐτόθι φέρει καρπὸν ἑρία).

*Gossypium indicum*, Lam.—Cotton Tree.

No claim can be made here for originality in identifying with cotton the substance mentioned in the following extracts. It is an identification about which commentators are agreed. It is only mentioned here on account of some special points of interest connected with it; but it might have been omitted for the same reason that so many other substances have been, namely, that their identity is not doubtful.

Herodotus<sup>97</sup> says: "One sees, besides, wild trees which, instead of fruit, carry a species of wool more beautiful and better than that of the sheep. The Indians dress themselves with the wool which they collect from these trees."

Ktesias, as related by several of his commentators, refers to the trees in India which bear wool.

Arrian, quoting from Nearchos, also refers to this product, which, in its woven state, was new to the Greeks who went to India in the army of Alexander.

A cotton from stones, mentioned by some early authors, appears to have been asbestos, as I have elsewhere suggested.<sup>98</sup>

The *κάπρασος*, mentioned in the Periplus as an export from Ariake to Egypt, was the Sanscrit *kārpasa*, signifying fine muslin. The name survives in the modern Hindustani word *kapas*, cotton.

8. THE SIPTAKHORA TREE (Σιπτάχορας).

*Schleichera trijuga*, Wild, and *Bassia latifolia*, Roxb.

In the account of ἡλεκτρον, on page 331, the identification of the *Siptakhora* has, by anticipation, been already suggested. It appears to combine the characteristics of two trees which are found in the same tract of country. The *Khusum* tree (*Schleichera trijuga*) was probably

<sup>97</sup> Thalie, lib. III. c. cvi.

<sup>98</sup> Proceedings, Royal Dublin Society, 1883, p. 83.

the tree which yielded the shell-lac, and it seems to have been confused with the *mhowa* (*Bassia latifolia*), since from the latter there exudes a gum without the aid of lac insects. It may, I think, be accepted as almost certain that the so-called dried fruits were, as has been explained, the dried flowers of the *mhowa*, which are at the present time largely used as an article of food, and for the extraction of an intoxicating spirit by distillation. Both trees are found together in the same jungles.

#### 9. LYCIUM (Λύκιον).

*Berberis tinctoria*, D. C., and *B. lycium*, Royle.

This substance, which, according to the Periplus,<sup>99</sup> was exported from Barbarikon (*i. e.* a town on the Indus, in Indo-skythia), and from Barugaza, *i. e.* Bharoch, was a plant whose roots yielded a dye, and the extract medicine.

It has already been identified, as pointed out by Mr. M'Crimble,<sup>100</sup> with the *rusot* of the natives, which is prepared from the two species of Berberry named above. The first of them, *B. tinctoria*, is found both in the Himalayas and the mountains of Southern India and Ceylon; but the other species is only known from the Himalayas.<sup>101</sup>

#### 10. BDELLIUM (Βδέλλα, or Βδέλλιον).

*Balsamodendron mukul*, Hooker. Called *Gugal* in Sind.

It appears to be generally admitted now, that this is the species of tree which yielded the gum-resin known to the ancients as Bdellium, and which, according to the author of the Periplus, was exported from Barbarikon on the Indus, and from Barugaza.

Dr. Stocks has described the collection of Indian Bdellium as follows<sup>102</sup>:—"In Sind the *Gugal* is collected in the cold season by making incisions with a knife in the tree, and letting the resin fall on the ground. It exudes in large tears soft and opaque, hardens and turns brownish black very slowly, a single tree is said to yield from one to two pounds weight. It is brought to the bazaars of Hyderabad and Karachi, where it sells at the rate of four shillings for 80lbs. =

The Bdellium of Scripture was, it is supposed, a siliceous mineral allied to onyx.

<sup>99</sup> The Periplus of the Erythrean Sea, by J. W. M'Crimble, p. 22.

<sup>100</sup> *Loc. cit.*

<sup>101</sup> Cf. Forest Flora, by D. Brandis, p. 22.

<sup>102</sup> Cf. Forest Flora, by D. Brandis, p. 14.

# 11. PEPPER (Πέπερι).

*Piper nigrum*, Linn.—Black Pepper (Sansk., *pippali*).

Mr. M'Crindle's note on this subject, when referring to the mention of it in the *Periplus*, is as follows:—"Kottonarik pepper exported in large quantities from Mouziris and Nilkunda; long pepper from Barugaza. Kottonara was the name of the district, and Kottonarikon the name of the pepper for which the district was famous. Dr. Buchanan identifies Kottonara with Kadattanadu, a district in the Calicut country celebrated for its pepper. Dr. Burnell, however, identifies it with Kolatta nadu, the district about Tellicherry, which, he says, is the pepper district."

Malabar continues to produce the best pepper in the world; but Sumatra and other islands cultivate and export largely.

The pepper vine is planted near trees which it ascends to the height of 20 or 30 feet. The berries, which are collected before being quite ripe, are dried in the sun; white pepper only differs from black by having the outer skin removed, for which purpose the berries are first macerated.

# 12. MALABATHRUM (Μαλάβαθρον).

*Cinnamomum tamala*, Nees, and *Dalchini*, Hin.

The leaves of this tree, which are known to the natives of India as *teppat* or *tajpat*, appear to be identical with the Malabathrum of the Greeks. It was obtained by the Thinaï from the Sesatai, and exported to India, conveyed down the Ganges to Gange, near its mouth; and it was also brought from the interior of India to Mouziris and Nilkunda for export.

Mr. M'Crindle<sup>103</sup> who seems to regard it as identical with betel (*Chavica betel*, Mig.), from which, however, it is quite distinct, mentions that according to Ptolemy (vii. ii., 16), the best varieties of Malabathrum came from Kirrhadia—that is to say, Rangpur in Eastern Bengal. The description given in the *Periplus* of how the Malabathrum was prepared by the Thinaï (Chinese?), from leaves which were used by the Sesatai to wrap up the goods which they brought to market, is very curious, and must refer to some custom of an Assamese tribe, which is still probably capable of illustration and elucidation. All the indications of position point to the mountainous regions included in and surrounding Assam as the home of the Malabathrum, and there in fact the above-named tree abounds, extending westwards to the Sutlej, and sparingly to the Indus; and eastwards to Burma. It is also found in Queensland, Australia.

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<sup>103</sup> Cf. *Periplus of the Erythraean Sea*, pp. 23, 26.

## 13. THE KARPION TREE (Καρπίον).

*Laurus (Cinnamomum) Sp. (?) Pandanus odoratissimus (?)*

Ktesias's description of this tree, according to Photios,<sup>104</sup> is as follows : " But again there are certain trees in India as tall as the cedar or the cypress, having leaves like those of the date palm, only somewhat broader, but having no shoots sprouting from the stems. They produce a flower like the male laurel, but no fruit. In the Indian language they are called *μυρὸνδα*, i. e. unguent roses. These trees are scarce. There oozes from them an oil which is wiped off from the stem with wool, from which it is afterwards wrung out and received into alabaster boxes of stone."

The nature of this tree has been much discussed. In some respects the description suits the *Pandanus*, the flowers of which yield, on distillation, a fragrant oil which is called *Keora* by the natives, and in these particulars, especially its palm-like habit, it corresponds least well with the characteristics of the cinnamon. Mr. M'Crindle's arguments in favour of its identification with the latter are of considerable cogency, though certainly not conclusive. He says : " I have little doubt that the Sanskrit *Karpura*, Camphor, is substantially the same as the Tamil-Malayalim *Karuppu* (oil of cinnamon), and Ktesias' *Καρπίον*, seeing that it does not seem to have any root in Sanskrit, and that camphor and cinnamon are nearly related. The camphor of commerce is obtained from a species of laurel (*Laurus camphora*, Nees.)," but this tree is not found in India, and it is believed that camphor itself was not known to the Greeks. Altogether it may be doubted whether a complete solution of the difficulty can be obtained. It is probable, however, that Ktesias jumbled together the characteristics of some species of *Laurus* with those of the screw pine (*Pandanus odoratissimus*).

## 14. CASSIA (Κασσία).

*Laurus cassia*,<sup>105</sup> Roxb., &c.

The term cassia appears to have been applied to different substances by the ancients, ten varieties are mentioned in the Periplus. They were produced chiefly from different species of *Cinnamomum*, but other plants wholly unallied to the laurel family may, it is thought by some authors, have contributed aromatic substances which were included in the same general denomination. As this subject has been dealt with by most commentators, more need not be said of it here.

<sup>104</sup> Ecloga in Photii, Bibl. lxxii. 28.<sup>105</sup> According to some authorities this is only a synonym for *L. tumala*.

15. INDICUM (Ἰνδικὸν μέλαν).

*Indigofera tinctoria*, Linn.—Indigo. *Nīlī*, Sansk. *Nīl*, Hin., &c.

Among the exports from the Skythic port of Barbarikon, on one of the mouths of the Indus, the above substance is enumerated in the Periplus, upon which Mr. M'Crindle<sup>106</sup> remarks:—"It appears pretty certain that the culture of the indigo plant and the preparation of the drug have been practised in India from a very remote epoch. It has been questioned, indeed, whether the Indicum mentioned by Pliny (xxxv. 6) was indigo, but, as it would seem, without any good reason. He states that it was brought from India, and that when diluted it produced an admirable mixture of blue and purple colours. The dye was introduced into Rome only a little before Pliny's time."

It is stated that as late as the close of the 16th century it was not known in Europe what plant produced indigo, although its preparation at Lisbon was described by Marco Polo. As is well known, it has hitherto been a most important product from British India, but the introduction of an artificial indigo renders it probable that the trade of the indigo planter is destined to become extinct ere long.

16. A TREE HAVING BEAN-LIKE PODS (Δένδρον λόπους ἔχον).

*Cassia fistula*, Linn. *Amulīas*, Hin. *Suvarna*, Sansk.

According to Strabo,<sup>107</sup> Aristobulus mentions "a tree, not large, bearing great pods, like the bean, ten fingers in length, full of honey, and says that those who eat it do not easily escape with life."

The above description suggests the pods of the *Cassia fistula*, which are sometimes two feet long. They include, besides the seeds, a sweet mucilaginous pulp, which, however, is not poisonous, but is regarded as a valuable laxative, the seeds may be noxious. Possibly the pulp, if taken in quantity, might produce disagreeable effects.

17. NARDOS (Νάρδος).

*Nardostachys jatamansi*, Jones—Spikenard.

From the Periplus we learn that gangetic nard or spikenard was brought down the Ganges to Gange, near its mouth, and was forwarded thence to Mouziris and Nelkunda. Spikenard, which was obtained in the regions of the upper Indus and in Indo-Skythia, was forwarded through Ozene (Ujein) to Barugaza (Bharoch), and was thence exported to Egypt.

The true origin of this aromatic drug was first discovered by Sir W. Jones,<sup>108</sup> who was followed in its investigation by Roxburgh<sup>109</sup> and Royle.<sup>110</sup>

<sup>106</sup> The Erythraean Sea, p. 17.

<sup>107</sup> B xv., C 1, § 21.

<sup>108</sup> As. Res., ii. p. 405.

<sup>109</sup> As. Res., iv. p. 109.

<sup>110</sup> Illust., p. 242.

They determined it to be the root of a plant named as above, which belongs to the Valerian family.

It is obtained in the higher regions of the Himalayas, and is brought down for sale in considerable quantities, being much esteemed by the people of Oriental nations generally on account of its strong fragrance.

It is called *sambal* in Hindi, and *balchur* in Hindustani.

#### 18. THE PURPLE FLOWER ("Ανθος πορφυρεῖν).

*Grislea tomentosa*, Roxb. The *Dhaura*, Hin.

Among Photios's extracts from Ktesias<sup>111</sup> there occurs the following passage:—"Near the source of the Hyparkhos there grows a certain purple flower, which is used for dyeing purple, and is not inferior to the Greek sort, but even imparts a more florid hue."

I am inclined to recognize in this description the flowers of the *Dhaura* tree (Sanskrit, *Dhatrī pushpika*, or *Agnivala*, i. e. flame of fire), which was named *Grislea tomentosa* by Roxburgh.<sup>112</sup>

It will be seen by reference to any of the Indian *floras* that the flowers of this wild jungle-shrub are largely used as a dye. Thus Brandis says they are collected in the North-west, and exported to the Punjab for dyeing silks; and Drury, that "in Kandeish, where the plant grows abundantly, they form a considerable article of commerce inland as a dye."

I have often seen baskets-full of the dried flowers exposed for sale at the fairs in Chutia Nagpur, together with crude shell-lac, i. e. in the same general region as that in which the Hyparkhos river was probably situated. The petals being minute, it is the coloured sepals which actually afford the dye.

#### 19. OIL OF SESAME ("Ελαιον σησάμινον).

*Sesamum indicum*, Linn. Gingely Oil, Eng. *Yelloo cheddie*, Tamil. *Til*, Beng.

This is one of the most valuable oil-yielding plants in India. Both seeds and oil are still largely exported from India, as they were, or at any rate the latter was, according to the Periplus,<sup>113</sup> from Barugaza (i. e. Bharoch), it having been brought there from the region in the Narbada valley, then known as *Ariake*.

It is much cultivated in India and Egypt, and has found its way even to the West Indies. The seed contains about forty-five per cent. of oil, which is, when carefully extracted, of a pale yellow colour. It has a sweet smell, and is one of the best substitutes for olive oil.

<sup>111</sup> Cf. Ancient India, by J. W. M'Crindle, p. 22.

<sup>112</sup> According to Brandis the proper name is *Woodfordia floribunda*, Salis.

<sup>113</sup> Cf. Periplus of the Erythrean Sea, by J. W. M'Crindle, p. 17.



20. *KOSTUS* (Κόστος).

*Aucklandia costus*, Falconer. Sansk., *Kushta*.

According to the author of the *Periplus*, *kostos* was exported from Barbarikon, at the mouth of the Indus, and from Barugaza, it having come from Kabul, through Proklais,<sup>114</sup> &c.

Much doubt existed as to the identity of this drug, till it was ascertained by Dr. Falconer to be the root of the above-named plant, which belongs to the order *Asteraceæ*. It inhabits the moist open slopes surrounding the valley of Kashmir, at an elevation of 8000 or 9000 feet above sea level.

The roots have a strong aromatic pungent odour, and are largely employed on account of their supposed aphrodisiac properties.

Considerable quantities, under the name *putchyk*, are still exported from Calcutta to China—or were some years ago; but it is possible the route from Lahore, whence they were brought to that port, has now been changed in favour of Bombay or Karachi. In China it is used in the manufacture of incense. Two varieties are distinguished by their colours and qualities.

21. MARINE TREES.

*Bruguiera gymnorhiza*, Lam.—Mangroves. *Kakra*, Beng.

According to a passage in Antigonus, we learn that Megasthenes, in his *Indika*, mentioned that trees grow in the Indian seas.

These were doubtless mangroves, which flourish in Sind, in the estuaries of the Indus, as well as on various parts of the coast of the peninsula, and the islands of the Bay of Bengal, spreading thence to the Northern parts of Australia. As is well known, mangroves grow below high-water mark, and, with their stems supported above ground by numerous roots, they present a singular appearance—one sure to attract the attention of European travellers in India.

Pliny's accounts of marine trees may possibly include the mangrove, but they are somewhat vague; they seem to refer rather to the appearances presented by different corals and algæ.

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<sup>114</sup> *Periplus of the Erythrean Sea*, by J. W. M'Crimble, p. 20.

## NOTE ADDED IN THE PRESS.

While these pages are passing through the press my attention has been drawn by Prof. Haddon to an article in the October number of the *Edinburgh Review* on Aristotle's History of Animals. Aristotle's history has not been often quoted in this paper, for the simple reason that it contains little or nothing of importance about Indian animals which is at the same time original. The statement of Pliny and Athenæus, that Alexander sent Indian animals to Aristotle, has been rejected as being without foundation by Humboldt, Schneider, and Grote. With this opinion, which is endorsed by the writer of the review, I fully agree, on account of the absence of original remarks regarding them; but I must take exception to part of what he says about Ktesias, for although he objects to Aristotle's mention of him as a man "unworthy of credit" (οὐκ ὄν ἀξιόπιστος), and as a "manifest liar" (φανερός ἐψευσμένος), he himself says that the following, together with some of the races of men mentioned by Ktesias, are "simply creatures of the imagination," or "altogether fabulous." The animals so denominated are the *Skolex*, *Dikairon*, *Martikhora*,<sup>115</sup> and the Indian ass, the origin of the stories regarding each of which, and their respective identifications, I venture to believe I have successfully explained in the foregoing pages. His opinion as to the identity of the *Krokottas* agrees, I observe, with mine.

It has occurred to me that the *Leurocotta* of Pliny (B. viii. ch. 30) was the Nilgai (*Portax pictus*). According to his description it was the size of the wild ass, with the legs of a stag, the neck, tail, and breast of a lion, the head of a badger, a cloven hoof, the mouth slit up as far as the ears, and one continuous bone instead of teeth. The last item I cannot explain; but the mane and tail of the Nilgai sufficiently resemble those of the lion to have suggested the comparison.

The *Hippelaphas* of Aristotle has also been supposed to be the Nilgai by some writers.

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<sup>115</sup> Topsell's fantastic figure of the *Martikhora*, given in his "History of Four-footed Beasts," which is reproduced by Miss Phipson in her "Animal Lore of Shakespeare," might easily be spoken of as a creature of the imagination.



